

Improving Skin Protection Practices in Rural Kansas 6<sup>th</sup> Graders

By

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## **Improving Skin Protection Practices in Rural Kansas 6<sup>th</sup> Graders**

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**Problem:** Skin cancer is a common cancer in the United States and often preventable with the use of sun modification behaviors (sunscreen, long sleeves, hats and sunglasses) (Centers for Disease Control [CDC], 2018). Prevention is a key to decreasing skin cancer incidence, its associated morbidity and healthcare costs. A low rate of skin protection education can be a contributing factor of sun damage especially in rural areas where there is greater exposure to the sun with farming, outdoor activities and low resources for educational interventions (Chun, Ohanehi, & Redican, 2015). Children and adolescents generally experience more cellular skin damage from ultraviolet (UV) radiation due to a thinner stratum corneum (Kunene et al., 2017).

The majority of sun damage occurs prior to 18 years of age, a time when most school age children are involved in outdoor activities with misconceptions that skin protection is not important (Butera, Clark, Georges, & Bush, 2015).

**Project Aims:** The overall aim of this DNP project is to improve skin protection practices in 6<sup>th</sup> graders in a rural Kansas town. The Project Director will: (1) assess perceptions regarding skin protection usage, (2) identify the barriers to skin protection in preadolescents, and (3) assess if the preadolescents after a skin cancer and protective sun health educational program intend to change any needed sunscreen practices.

**Project Method:** This quality improvement project will be conducted at a grade school in Onaga Kansas. The sample will be approximately nineteen 6<sup>th</sup> grade students. Using a self-reported pre-test/post-test design, the Project Director assessed the perceptions, barriers, and the intent to

change current skin protection practices of these 6<sup>th</sup> graders following the SunWise educational sun protective package. This presentation included a 60-minute session consisting of a SunWise PowerPoint presentation and an interactive program utilizing an ultraviolet (UV)/Skin Protection Factor (SPF) Frisbee demonstration. Descriptive statistics in the form of the Fishers exact test was utilized to evaluate the pre-post test scores related to the knowledge, benefits, and intent to change any needed sun practices in this rural Kansas preadolescent sample.

**Results:** Pre- and post SunWise questionnaires were completed by nineteen rural Kansas 6<sup>th</sup> graders. The Fisher Exact test was used to calculate statistical significance ( $p < 0.05$ ). There was statistical significance found related to perception: Tans look healthy ( $p < 0.001$ ); Do you like to tan ( $p = 0.021$ ); and Keeping your skin safe ( $p < 0.001$ ). Statistical significance was also found related to improvement in knowledge: What SPF sunscreen will you use ( $p < 0.001$ ); and When you need the most sun protection ( $p < 0.001$ ). There was limited intended behavioral practice change with playing in the shade increasing from 21% to 73% ( $p = 0.002$ ) and intentions to use sunscreen increasing from 42% to 73% ( $p = 0.001$ ). There were no significant findings for increased barrier use: Hats ( $p = 0.723$ ); Long-sleeves ( $p = 0.232$ ); and Sunglasses ( $p = 0.068$ ).

**Conclusion:** The SunWise sun protection educational intervention is an effective model for skin health in the rural adolescent population. Improvement in perception, knowledge with limited improvement in intent to change behavioral practices were found following this DNP project.

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Non-melanoma skin cancer (Basal cell) is the most common form of skin cancer in the United States. With modification of sun exposure, most individuals can reduce risk factors for all types of skin damage (Centers for Disease Control [CDC], 2018). Basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) are referred to as non-melanoma skin cancer (NMSC) (CDC, 2018; Skin Cancer Foundation [SCF], 2018). Squamous cell skin cancer can metastasize to distant organs. Melanoma is the most aggressive type of skin cancer can easily metastasize and prove fatal (SCF, 2018; CDC, 2018). The sun's damaging effects comes from ultraviolet radiation (A & B) that may lead to premature aging, wrinkles, and skin cancer. A history of sunburn has been shown to increase the risk in the development of skin cancer (SCF, 2018).

In addition, the cost of skin cancer treatment in the United States is 8.1 billion dollars with 4.8 billion of that treating non-melanoma skin cancer (SCF, 2018). In terms of lost days to treatment, scarring, or loss of function, improved skin protection practices can decrease these damaging effects. This includes the use of hats, sunscreen, long sleeves, and decrease tanning bed usage (Kunene et al., 2017; Lucas, Loescher, & Pacheco, 2016).

The majority of sun damage occurs prior to 18 years of age, a time when most school age children are involved in outdoor activities with misconceptions that skin protection does not matter (Butera, Clark, Georges, & Bush, 2015). Therefore, the purpose of this DNP project is to provide a quality improvement sun protection education program to 6<sup>th</sup> graders in a rural Kansas school. The DNP Project Director will measure perceptions and any changed skin protection behaviors.

### **Statement of Problem**

One of the Healthy People 2020 initiatives is to promote educational interventions/behaviors to prevent the skin damaging effects of ultraviolet radiation (Healthy

People 2020, 2018). In addition, the Surgeon Generals Call to Action (2014) proposed sun protection programs in the school setting as a potential intervention to benefit school aged children.

A low rate of skin protection education can be a contributing factor of sun damage especially in rural areas where there is greater exposure to the sun with farming, outdoor activities and low resources for educational interventions (Chun, Ohanehi, & Redican, 2015). There is an overall lack of sun safety intervention within schools in general with the study by Jones and Guy (2017) stating that sun protection was uncommon and sun safety varied by region in the United States.

The focus of this quality improvement (QI) project is to utilize existing knowledge to improve sun protection usage within a rural preadolescent sample population. The state of Kansas has no officially recognized sun protection program but education in skin protection practices is essential to develop effective preventive behaviors. A skin protection educational program can influence a potential change in behavior for the targeted preadolescent population. This initiates a conversation to provide updated and consistent information for preadolescents at a time when improved skin protection usage can influence lifetime risks.

According to the Kansas Department of Health and Environment [KDHE] (2016) Behavioral Risk Factor Surveillance System (BRFSS), 1 in 16 Kansans were diagnosed with skin cancer in 2016. This corresponds to the KDHE (2015) report that rates of melanoma in Kansas increased from 16.3 cases per 100,000 people in the year 2000, to 23.4 cases per 100,000 in 2011. The significance of this current project is reflected in the Kansas Cancer Partnership (2018) within its cancer prevention and control plan that promotes sun safety polices to reduce sunburns and indoor tanning for school age Kansans which also recommends an overall increase



in sun protection interventions. This also corresponds to the CDC 2018 skin cancer prevention progress report which notes that there is a need to increase sun safety programs within school systems.

### **Literature Review**

In this literature review a brief overview of skin pathophysiology will be described to identify the process of skin damage from ultraviolet radiation. A synthesis of three school based sun protection educational programs will be undertaken to promote a better understanding of existing sun protection/skin cancer education and prevention programs. Each school based sun protection programs will be discussed independently covering the programs history, outcome measures, and data collection. The three applicable sun protection education programs include: 1) Sun Smart, 2) Students are Sun Safe (SASS), and 3) SunWise.

### **Pathophysiology of Cancer from Sun Exposure**

The skin is the largest organ of the body, consisting of the outer multilayered stratified epithelium, and inner dermis separated by a basement membrane. As the skin is exposed to the damaging effects of ultraviolet radiation from the sun this could predispose an individual to DNA mutations thus leading to a potential increase for cancer (Grossman & Porth, 2014; Guyton & Hall, 2016). Both UVB (290-320 nm) and UVA (320-400 nm) components of solar radiation are strongly implicated in the etiology of non-melanoma skin cancers (Grossman & Porth, 2014; Pour, Saeedi, Semnani, & Akbari, 2015) The acute effects of ultraviolet radiation are short lived, but chronic exposure acts mainly on the basal layer of the epidermis producing free radicals that induce single-strand DNA breaks. Prolonged exposure to ultraviolet radiation increases the generation of reactive oxygen species (ROS) a type of free radical that plays a part in cellular injury leading to oxidative stress (Grossman & Porth 2014; Kumar, Abbas, & Aster, 2018).

Oxidative stress refers to cellular abnormalities (DNA strand breaks) induced by ROS and the inability of the skin surface to repair the damage. When oxidative stress occurs in the skin by excessive absorption of ultraviolet light a free radical damage cascade occurs. UVA radiation absorbed by DNA bases may also damage DNA through photodynamic effects that involve singlet oxygen and less by hydroxyl radical in cellular DNA and skin. UVB radiation is also able to induce oxidative degradation pathways, however, as a minor process, in cellular DNA. Thus, ultraviolet B generates more oxidative stress but ultraviolet A has a greater cytotoxic effect by inducing DNA strand breaks (Grossman & Porth, 2014; Kumar, Abbas, & Aster, 2018; Pour, Saeedi, Semnani, & Akbari, 2015). The earlier in life that the skin has been exposed to ultraviolet radiation the greater the chance of DNA mutations. Children and adolescents generally experience more cellular skin damage from ultraviolet (UV) radiation due to a thinner stratum corneum which is prone to DNA alteration (Butera, et al., 2015; Pour et al., 2015; Kunene et al., 2017). A school based sun protection education program can mitigate the exposure to the sun thus leading to improved long term outcomes for the school aged child (Gage et al., 2018).

### **School based Sun Protection Education Programs**

There is no one sun protection education program that is promoted in the United States. However, in Australia, New Zealand, and some European countries Sun Smart is promoted as a uniform method of sun education (Dudly et al., 2017; Oyebanjo & Bushell, 2014). Sun Smart started in Australia in 1988 with the original sun protection message (Slip! Slop! Slap!), that played a pivotal role in improving sun protection behaviors of all Australians (SunSmart, 2019). SunSmart educational programs can now be found in both the California and Nevada school systems (Kouze, Thompson, Herington, & Helzer, 2017; Miller et al., 2015).

The outcome measure of the SunSmart educational program is to decrease UV radiation damage at the school-age level. This is accomplished through multiple age-level games and activities to engage the school-age child: SunSmart game boards, Dress Sid the Seagull, and SunSmart UV apps (SunSmart, 2019). Data collection and evaluation of the program effectiveness is accomplished with self-reported pre/post intervention surveys that track the school-aged child/adolescent changes in knowledge, attitudes and intent to change behaviors (Kouze et al., 2017; Miller et al., 2015).

University of Arizona college students provide the curriculums in the Students are Sun Safe (SASS) school based educational program that is for middle school and high school level children. This program was developed in 2010 by the University of Arizona in partnership with a multi-level disciplinary group consisting of a nursing student, teacher, epidemiologist, dermatologist and behavioral scientist (Davis et al., 2015). In the SASS program the University of Arizona student undergoes training and ultimately presents the curriculum which includes: a 25 minute PowerPoint and three student interactive activities. The outcome measure of the SASS educational program was to increase self-efficacy in the school aged child by including in the PowerPoint photos of average and famous individuals who have damaged skin due to UV radiation (Davis et al., 2015). Data collection is accomplished with pre- and post-intervention surveys administered to students to determine growth in knowledge, attitudes and intent to change behaviors. As of 2015 nine Arizona schools and 1,284 students have completed the SASS school based intervention (Davis et al., 2015).

The SunWise program was developed by the Environmental Protection Agency (EPA) in 1998 for use in schools across the U.S. and currently is being administered by the National Environmental Education Foundation (NEEF) with support from Johnson & Johnson Consumer

Inc. (SunWise, 2019). Schools and teachers can order a SunWise Toolkit that includes interactive activities for school children (K-8) with the outcome measure of the program designed to increase sun protection behaviors, lower the effects of UV radiation, and identify risk factors in sun damage. Most appealing about this program, all toolkit activities can be administered with a minimal time commitment (1-2 hours a year). The SunWise educational program underwent a multidisciplinary review by a panel of educators, curriculum specialists, and skin cancer researchers (Geller, Rutsch, Kenausis, Selzer, & Zhang, 2003). An economic feasibility study on the SunWise program was completed indicating that even modest improvements in sun protection behaviors translates into future savings in costs associated with skin cancer treatment, loss of productivity, and mortality (Kyle et al., 2008).

The literature reveals that the direction of sun protection programs should selectively focus on crucial information geared to the preadolescent population. A study by Koch et al. (2016) demonstrated that any preadolescent sun protection campaign should consider peer pressure and fashion trends by using open communication to disseminate the crucial information of sunscreen, seeking shade and wearing protective clothes. Two other studies reported older children indicate an ambivalent attitude toward sun protection and seemed to abandon sun safety practices taught in early childhood (Hutchinson, Prichard, Ettridge, & Wilson, 2014; Williams, Grogan, Clark-Carter, & Buckley, 2013). These studies suggest that the importance of appearance is a strong motivator for the preadolescent and a school based targeted sun protection program should encourage discussions among peers with the idea to introduce sunless tanning as opposed to excessive exposure to UV radiation.

Eastabrook, Chang, & Taylor (2016) determined that after teen females viewed ultraviolet photo aging of their facial skin and one 45-minute educational session participants

showed an increased willingness to change future sun protective behavior. Interestingly, this studies interpretative phenomenological analysis may have shown increased willingness to change sun protective behavior but did not change the mindset concerning the teen's belief in invincibility regarding melanoma from too much UV radiation.

Chen, Ohanehi, and Redican (2015) indicate that rural youth are at increased risk of skin cancer when compared to other cohort groups. These authors suggested that no standard interventions have been assessed in the rural population but that overall sun protective behaviors were increased after a skin protection/sun prevention educational program.

The literature review supports the need to conduct this DNP quality improvement project in a rural Kansas school. The SunWise educational program was chosen for this project based on the ability of all toolkit activities to be administered with a minimal time commitment (1-2 hours a year). This project will provide an opportunity to assess the rural Kansas preadolescent's perception regarding skin protection use, knowledge of barriers to skin protection practices and behavior change after a skin protection and education program. The intent of this DNP project is to not produce new knowledge but to utilize SunWise to implement change.

### **Definitions Conceptual and Operational**

#### **Ultraviolet Radiation**

Conceptually, on the electromagnetic spectrum, ultraviolet light (UV) occurs between X-rays and Visible light at 200 and 400 nm (nm: one billionth of a meter) (Campbell, Reece, & Simon, 2007; Grossman & Porth, 2014). Excessive ultraviolet exposure can have damaging effects on skin cells. Ultraviolet A (UVA) is responsible for tanning which can cause premature aging and wrinkles, while ultraviolet B (UVB) is primarily responsible for the burning effects to skin (SCF, 2018). Operationally, UV light will be explained to the 6<sup>th</sup> grader.

### **Free Radical Damage**

Conceptually, free radicals are generated by excessive absorption of radiant energy like ultraviolet radiation from the sun. Free radical damage in the skin leads to depletion of Langerhans and immune cells causing damage at the DNA level which has the potential for malignant transformation (Grossman & Porth, 2014; Kumar et al., 2013). Operationally, free radicals are generated by UV light and can cause skin damage to the 6<sup>th</sup> graders if UV protection is not used.

### **Sun Exposure**

Conceptually, sun exposure is the pigmentation induced by UV radiation. Skin damage induced by UV radiation is caused by excessive sun exposure leading to aging of the skin and a predisposition to skin cancer (Grossman & Porth, 2014; SCF, 2018). Operationally, sun exposure of UV radiation may occur in the 6<sup>th</sup> graders in a rural Kansas grade school if the students do not use UV protection.

### **Skin Cancer**

Conceptually, cancer occurs when a cell mutates then grows rapidly and uncontrollably. Skin cancer is an abnormal growth of cells on skin exposed to repeated natural and artificial ultraviolet light causing damage at the cellular level (SCF, 2018). Cancer of the skin can cause three main types: Basal, Squamous and Melanoma. Operationally, it is an abnormal growth of skin cells in 6<sup>th</sup> graders due to sun exposure.

### **Skin Protection Practices**

Conceptually, skin protection practices are barriers (hat, long sleeves, sunscreen lotion) used between the skin and the sun/ultraviolet rays. Operationally, skin protection practices are

barriers to sun exposure that the 6<sup>th</sup> graders in a rural grade school in Kansas use to reduce damage from UV radiation.

### **Sun Protection Factor (SPF)**

Conceptually, sun protection factor (SPF) refers to a sunscreen products ability to block damaging ultraviolet light expressed as a number with the highest numbers conferring the greatest protection. Operationally, this would be 6<sup>th</sup> graders using a SPF sunscreen of at least 15 while outdoors measured by pre/post SunWise survey questions.

### **Project Aims**

The overall aim of this DNP project is to improve skin protection practices in 6<sup>th</sup> graders in a rural Kansas town. The Project Director will: (1) assess perceptions regarding skin protection usage; (2) identify barriers to skin protection; and (3) assess if the preadolescents after a skin cancer and protective sun health educational program intend to change any needed sunscreen practices.

### **Project Questions**

1. What are the perceptions regarding skin protection usage in 6<sup>th</sup> graders in a rural Kansas town?
2. In a group of rural Kansas 6<sup>th</sup> graders, what are the barriers in sun protection?
3. Does the SunWise skin cancer and Sun Health educational programs positively influence a group of rural Kansas 6<sup>th</sup> graders skin protective perceptions and behaviors?

### **Conceptual Framework**

The conceptual framework that will be used to guide this DNP project is the Plan-Do-Study-Act (PDSA) cycle. Healthcare has adapted the PDSA cycle as a tool for quality improvement (Hall & Roussel, 2014). The use of the PDSA cycle in this DNP project will be to test the change in sun protection health behaviors in rural Kansas preadolescents after the impact

of a sun protection education program. The PDSA cycle is an accepted framework for any small scale, action orientated, change intervention (Melnyk, Fineout-Overholt, 2015).

An established framework such as PDSA will promote understanding as to why individuals engage in certain behaviors and not others. Many thoughts have been developed on how to encourage preadolescents to develop skin protection behaviors but an emphasis on the cognitive process to bring about change through education and motivation should be considered when designing, implementing and evaluating a quality improvement framework. In terms of positive sun protective behaviors; change needs to extend beyond the classroom to everyday practice.



Figure 1. PDSA cycle. (retrieved from <https://www.google.com/search/pdsa+templates+for+healthcare>)

Sun damage at a young age is a significant health threat that has been inconsistently addressed at the school level. Identification of this gap in care has led to the PDSA cycle for this project to implement an established SunWise education program and determine the impact on the outcome of improved sun protection behaviors. In this project an intervention is planned (sun protective education), implemented on a small scale (rural 6<sup>th</sup> grade classroom), studied to learn from acquired data (pre/post survey testing) and then act/learned from the experience to



corroborate the practice change (outcome of more sun protective behaviors). This proposed project will focus on a sun protective educational program that when presented to a preadolescent; demonstrating a reasonable assessment of risk, the seriousness of the condition and coping mechanisms to overcome barriers, the outcome will be an increase in beneficial health behaviors. For this DNP SunWise educational project that would be an increased use of sunscreen, hats, sunglasses, and long sleeves from pre- to post survey. With this quality improvement project, incorporating the PDSA cycle will lead to the importance of sun protective behavior in the rural population.

## **Methodology**

### **Design**

A quality improvement PDSA design is used for this DNP project with the Project Director the instructor and organizer. A pre-test/post-test design was utilized to test the degree of change that occurred after the SunWise educational sun protective behavior intervention. For this DNP project there was no random assignment with regards to dividing preadolescents into groups; using pretesting to determine similarity at the study initiation of all students then posttest to explore the differences that education of sun protective behaviors and knowledge made. A SunWise survey response scale was utilized (Appendix A & B). These questions were developed for use with the SunWise program, and the Project Director obtained permission to use the program for this project (Appendix C). All participants were voluntary by exclusion parental consent (Appendix D). Participation included a 60- minute interactive session utilizing a SunWise PowerPoint presentation (Appendix E), and interactive program consisting of a UV/Skin Protection Factor (SPF) Frisbee demonstration (Appendix F). All of these activities are based upon the SunWise education program.

## **Setting of Study**

For this QI project, the setting was at the Onaga, Kansas grade school located in rural Northeastern Kansas. This school includes grades 1 thru 6 with over 150 students. Before this project began the Project Director contacted the school administrator and the 6<sup>th</sup> grade teacher and obtained written permission (Appendix G).

## **Sample**

This DNP project utilized a convenience sampling of those attending the Onaga grade school in Onaga, Ks. The project participants were 6<sup>th</sup> grade students aged 12-13 years old during a science class. Inclusion criteria: male and female students in the 6<sup>th</sup> grade class at one designated grade school with no signed parental exclusion participation form. Exclusion criteria: those students with a signed exclusion participation form, or do not want to volunteer to participate in the project.

## **Data Collection Plan**

Data collection was an anonymous, pre-and post-auditing of a SunWise educational intervention at the Onaga, Kansas grade school site (6<sup>th</sup> grade only). The surveys were color coded to identify pre-testing (white) from post-testing (green) results, and each participant was assigned their own unique identification number that did not include the names of the student or any other identifiers. The survey was an established SunWise demographic, multiple choice, yes/no and Likert type questionnaire that measured the student's knowledge of sun protective behaviors and skin cancer knowledge (Appendix A & B). All surveys were completed with pencil and paper. The SunWise survey included 28 questions, was pilot tested on children 6-7 years old, and took less than 10 minutes to complete (Geller et al., 2003). For this DNP project both the pre and post surveys each took a little over 13 minutes to complete. All the data was

collected by the Project Director and divided into three categories to address the three project aims: (1) Perception of sun protection use, (2) Knowledge of sun safety and protection, and (3) Identify any change in sun protective behaviors/barriers post SunWise educational intervention.

### **Timeline**

The first phase of this projects timeline was from Feb 2019 to May of 2019. During this time the Project Director developed contacts and obtained approval. This included establishing communication with the Principle of the Onaga, Kansas grade school, and sixth grade teacher to present the project information to the selected class and participating students. The Project Director submitted and obtained approval from the Institutional Review Board (IRB) at the University of Kansas Medical Center. (Appendix H) Project implementation and data collection began at the Onaga, Kansas grade school after the IRB approval and proposal acceptance by KUMC faculty which occurred in February, 2019.

Post implementation data collection occurred immediately after the presentation of the SunWise educational program at the selected school. Fishers' exact testing and item analysis was initiated and the Project Director worked with the KUMC Biostatistics department to complete the statistical interpretation. Dissemination of the findings will occur at the DNP final proposal defense hopefully in the fall semester of 2019.

### **Evaluation Plan**

Data evaluation with the Fischer's exact test was used to describe the resulting pre- and post-data on current sun practices and the sun protection perceptions, knowledge and behavioral change based on the SunWise education intervention. The Project Director consulted with the department of Biostatistics at the University of Kansas Medical Center for assistance with the statistical analysis. Based on the statisticians' suggestion the Fishers Exact test would be used

with a significance threshold set at  $<0.05$ . The Fishers Exact test is employed to assess the probability of occurrence and association between two categorical variables when the sample size is small (Dawson & Trapp, 2004). All nineteen participants' pre and post questionnaire results were entered into an Excel spreadsheet. The four point Likert scale questions with the options of: yes, most likely, probably not and "no" were simplified to yes/no questions. For calculation methods the "most likely" category was grouped with "yes" and the "probably not" entered with the "no" group. For the Liker scale questions with five choices: "never, rarely, sometimes, often, and always were simplified into a three point Liker scale: rarely/no, often/always and sometimes. Demographic data and those questions with multiple answers were assessed using measures of central tendency. The Fischer's exact test was utilized to analyze the relationships between the study covariates of sun protective perceptions, knowledge, and behavioral and barrier change based on this DNP projects aims. The Project Director followed-up with both the 6<sup>th</sup> grade teacher and the health class teacher to evaluate the projects impact on sun exposure in these students and to encourage sustainability within the school organization.

### **Protected Health Information**

Participation in this QI project was voluntary for all students. The gathered data was used to evaluate and predict individual health behavior change in rural skin care practices as a result of this quality improvement project. Informed exclusion consent was gathered from all study participants with a standardized exclusion form sent home with the preadolescent students for parental signature. No identifiers or protected health information was used within this project that could be traced back to the study participants. All surveys were anonymous. While not in use the data was stored on paper in a locked file cabinet behind a locked door at the Project Directors home. The electronical data was stored behind a password protected KUMC firewall

database. Data was gathered by hand immediately post-educational presentation then placed in statistical form and stored electronically by the Project Director for dissemination. Only the Project Director, statistician and faculty member had access to any raw survey data.

## **Results**

### **Findings of the project**

In this rural Onaga, Kansas grade school a total of nineteen 6<sup>th</sup> grade respondents filled out the pre- and post SunWise educational intervention questionnaires. The SunWise pre- and post-intervention questionnaire contains twenty-eight questions. For this DNP project data were collected to evaluate the three main aims: (1) Perception of sun protection use, (2) Knowledge of sun safety and protection, and (3) Identify any change in sun protective behaviors/barriers post sun protective intervention. Secondary data were collected on the current sun protection practices of the rural 6<sup>th</sup> grade participants. Project implementation included a 60 min educational session using the SunWise PowerPoint and an interactive SPF Frisbee demonstration. This project was implemented at the Onaga grade school prior to summer break on April 16, 2019. A follow-up educational program working with the health teacher was conducted on April 18, 2019.

### **Demographics**

Nineteen 6<sup>th</sup> graders participated in this SunWise educational intervention; ten boys (52.6%) and nine girls (47.4%). The participants were the typical ages for the 6<sup>th</sup> grade, four of the participants were 11 years old (21.1%), thirteen were 12 years old (68.4%), and two were 13 years old (10.5%). (Table 1) Based on categorizations of hair color, the majority of participants had brown hair at 52.6%, with blond at 42.1% and black hair at 5.3% with none reporting red hair. (Table 1)

### **Current Sun Practices**

Current sun practices evaluated within this DNP project indicate for these rural 6<sup>th</sup> graders sunscreen is applied “Always/Often” by ten out of nineteen participants (53%), with six (31%) stating they use sunscreen “Sometimes” and three (16%) reporting “Never/Rarely”. (Figure 2)

When asked reasons why sunscreen is not always used the most commonly chosen answer is: “I forget to put on sunscreen” in 10 out of 19 participants (53%). Additional reasons participants did not like to use sunscreen was that sunscreen feels greasy on the skin or it stings the eyes with only two out of the nineteen participants (10.5%) stating they always wear sunscreen. As to why sunscreen was not used one participant crossed off all typed optional selections and wrote his own “When I put it on it will give me a sunburn”.

When evaluated on the areas where sunscreen should be applied only seven out of nineteen participants (37%) indicated the correct answer which is: Face, Ears, Arms, Stomach, Shoulders, Neck, Legs, and Back. Two participants (10.5%) indicated they don’t put sunscreen on any of these areas and the other ten (53%) had multiple areas but none the same in this multiple choice question. The results of the current skin care findings coincide with two other previous studies that indicate adolescents do not reliably and uniformly use sunscreen protection (Hutchinson, Prichard, Ettridge, & Wilson, 2014; Williams, Grogan, Clark-Carter, & Buckley, 2013).

When asked the question “How many times did you get sunburned?” nine out of nineteen participants (47.3%) replied that they got three or more sunburns in the past year, eight participants (42%) got one-two sunburns last year and only two participants reported no sunburns. (Figure 3) These findings are in accordance with research that implicates excessive UV radiation a potential carcinogen, that increases DNA gene mutations, oxidative stress, and an

increased inflammatory response which can place these participants at an increased risk for skin cancer (Lucas, Loescher, & Pacheco, 2016; SCF, 2019). The high levels of sunburn also correlate to the Geller et al. (2003) research that found 62% of participants reported at least one sun-burn the previous year.

### **Perception**

Perception regarding to tanning practices with the questions “Do you like to get a tan” and “Do you think people look healthier with a tan?” yielded statistic results at  $p=0.02$  and  $p<0.001$  respectively. (Table 2) At baseline when asked “Do you like to get a tan?” 74% of the participants answered “No” on the post questionnaire survey. (Figure 4) This was similar to a study by Chen, Ohanehi and Redican (2015) with their research on rural adolescents ( $p<0.05$ ). The data also correlates with Geller, Rutsch, Kenausis and Zhang (2003) perception question “People looked healthier with a tan” which improved post SunWise intervention ( $p<0.001$ ).

When the participants were asked the perception question of “Keeping your skin safe from the sun is:” baseline results had zero in the “Easy to do” column whereas at post intervention 84% thought it easy with a statistical result of ( $p<0.001$ ). Overall, there was a significant difference in the rural 6<sup>th</sup> Grader participants’ perception reflecting a positive response towards skin protection practices after the SunWise educational intervention. (Table 2)

### **Knowledge**

All participants were asked a pre-test knowledge question: What are some of the ways you can keep your skin safe from the sun? Interestingly, only two out of the nineteen participants (10.5%) correctly answered all possible ways to keep your skin safe. Correct answers were: “Using sunscreen”, and “Wearing a shirt and hat outside” with the incorrect answer as: “Eating cereal”. One of the correct answers, “Using sunscreen”, was chosen by sixteen out of the

nineteen pre-intervention participants (84.2%) indicating at least a base level of understanding by these rural 6<sup>th</sup> graders on sun protection (Figure 5).

Using the Fisher Exact test sun protection knowledge was evaluated with four questions (Table 3). All were proved to be statistically significant indicating participants increased their sun protection knowledge after the SunWise intervention. At baseline 21% of rural 6<sup>th</sup> graders were aware of the correct SPF level to use in the sun, whereas post-test that number increased to 100% (Figure 6). In a previous study by Sardi et al, (2016) they found that half the rural participants who were evaluated could correctly identify the SPF level.

### **Intended Practices:**

The intended behavioral and barrier practice change for this group of rural 6<sup>th</sup> graders was assessed with six questions (Table 4). Three questions: “Intention to play in the shade” ( $p=0.002$ ), “Intentions to apply sunscreen” ( $p=0.001$ ) and “How many hours a day will you spend outside between 10a to 4p?” ( $p<0.001$ ) are all statistically significant. Overall, participant intentions in this DNP project to play in the shade increased 21% to 73% and use of sunscreen increased from 42% to 73% pre- and post-testing. (Figures 7, 8)

The other three questions “Will you wear a hat? ( $p=0.72$ ), “Will you wear long-sleeves?” ( $p=0.23$ ) and “Will you wear sun-glasses? ( $p=0.068$ ) did not demonstrate a statistically significant result. (Table 4) Within this project this is best demonstrated with the question “Will you wear long-sleeves” in both the pre and post SunWise educational intervention questionnaire no participants marked “Often/Always” as a choice. This matches the SunWise study by Geller et al. (2003) who demonstrated little difference at post-testing with sun barrier use; sunglasses, long-sleeves, and hats.

### **Implementation Strategy**



Acknowledging the role schools play in sun protection education this DNP project encouraged the inclusion of long term strategies to increase the availability in a rural school setting. To facilitate sustainability the Project Director offered to be a consultant. Working with the Principle and a health teacher to incorporate the SunWise activities into a health class lesson plan the Project Director made a follow up presentation at the Onaga School. The Project Director collaborated with the Health teacher to implement the SunWise education into the class curriculum. To that end the Project Director left behind the SunWise PowerPoint presentation, Frisbee, and sunscreen for utilization by the health teacher.

### **Conclusion**

The purpose of this QI project was to improve skin protection practices in 6<sup>th</sup> graders in a rural Kansas town. The Project Director used the SunWise sun protective educational materials for adolescents to increase the understanding of sun exposure and the need for sun preventive barriers. The Project Director had three aims to the implementation of this quality improvement project with two out of the three aims demonstrating overall statistical significant improvement. The third aim to change sun protection practices had limited improvement with increased intention to play in the shade and sunscreen use but none in increased sun barrier use (sunglasses, long-sleeves and hats). The intention to practice some sun safe behaviors post intervention (play in the shade and sunscreen use) may reveal a perceived benefit to sun protection due to an increased knowledge of sun protection given during the intervention. The findings from this DNP project are congruent with other sun protection research (Chen et al. 2015; Davis et al. 2015; Geller et al. 2003; Lucas, Loescher, & Pacheco, 2016; Saridi et al. 2016).

There were several limitations of this project: a small sample size and completed in only one rural sixth grade class which could limit its generalizability. However, future research in the rural setting could involve a long term multi-faceted curriculum evaluation within the school system as in the case of Nevada (Kouzes et al. 2017). In addition changing school policy/practice by providing sunscreen reminders to parents prior to school outings and recess would be possible ways to increase the benefits of sun protection knowledge. To promote sustainability this DNP project has encouraged integration of sun protection within the school curriculum. This DNP project has demonstrated that for rural Kansas 6<sup>th</sup> graders SunWise education can be successfully implemented as a strategy for sun protection.

**Table 1.**  
Participants Characteristics

<b>Variable</b>	<b>All Participants (n=19)</b>
Gender	
Female	9 (47.4%)
Males	10 (52.6%)
Age	
11	4 (21.1%)
12	13 (68.4%)
13	2 (10.5%)
Hair Color	
Blond	8 (42.1%)
Brown	10 (52.6%)
Black	1 (5.3%)

Table 2 Perception questions

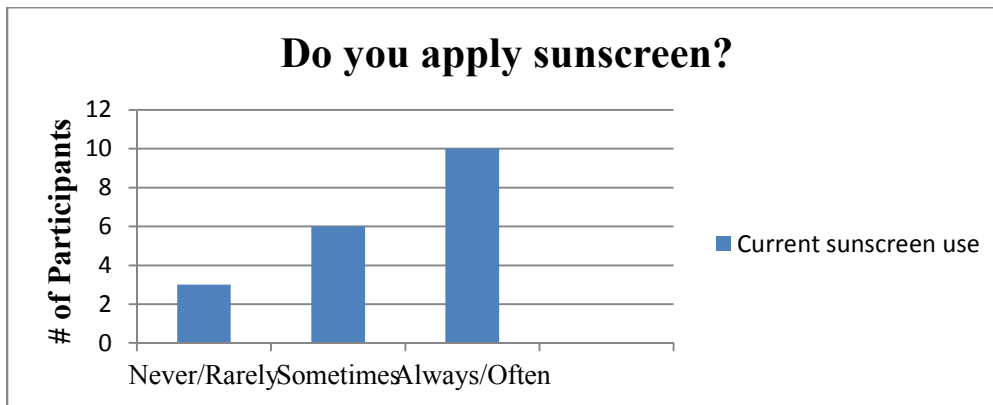
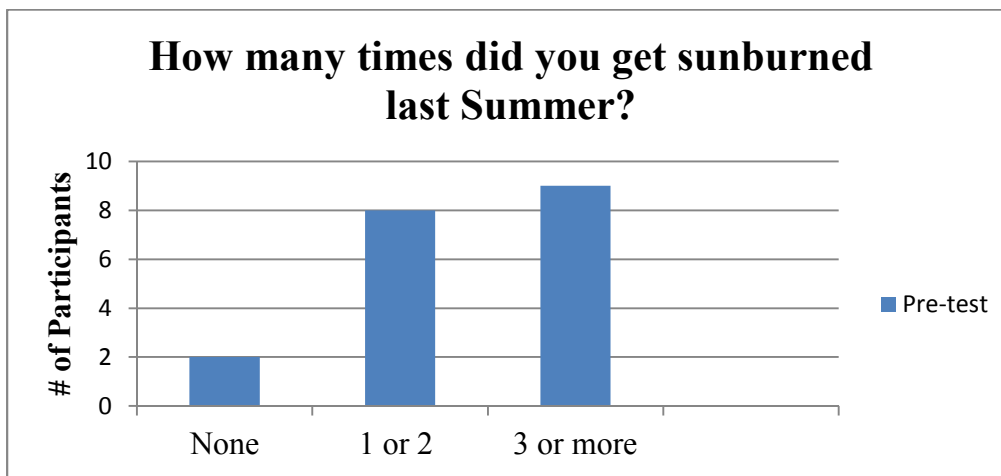
Perception Questions	Fisher Exact Test Results
Does your skin burn easily in the sun?	p=0.028
Keeping your skin safe from the sun is:	p<0.001
Do you like to tan?	p=0.021
Do you think people look healthier with a tan?	p<0.001

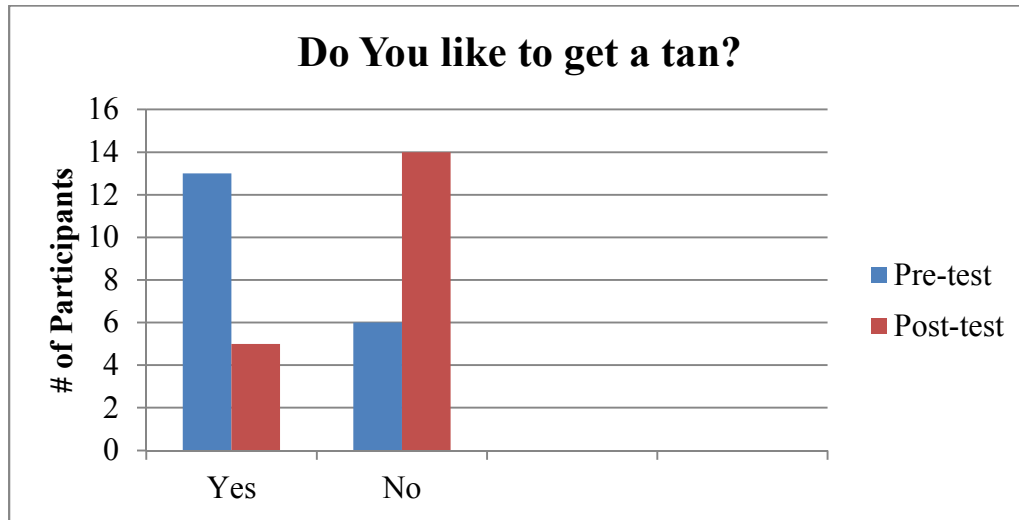
Table 3. Knowledge Questions and Results

Knowledge Questions	Fisher Exact Test Results
When do you have to use the most sun protection?	p<0.001
You can get a sunburn on a cloudy day?	p=0.046
You only need to wear sunscreen when you are at the beach or pool?	p=0.001
If you wear sunscreen, what number SPF will you use?	p<0.001

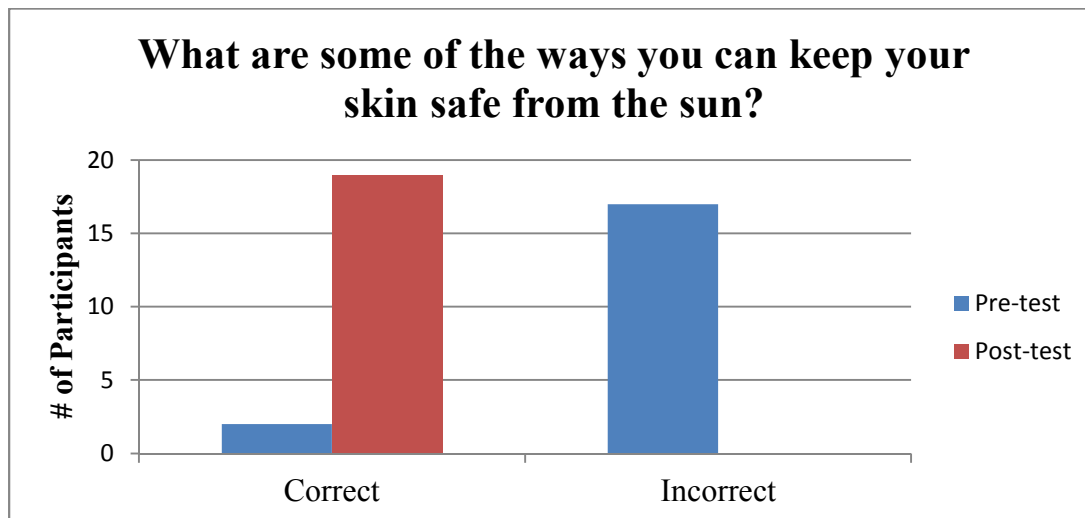
Table 4. Intended Behavior/Barrier Practice Change

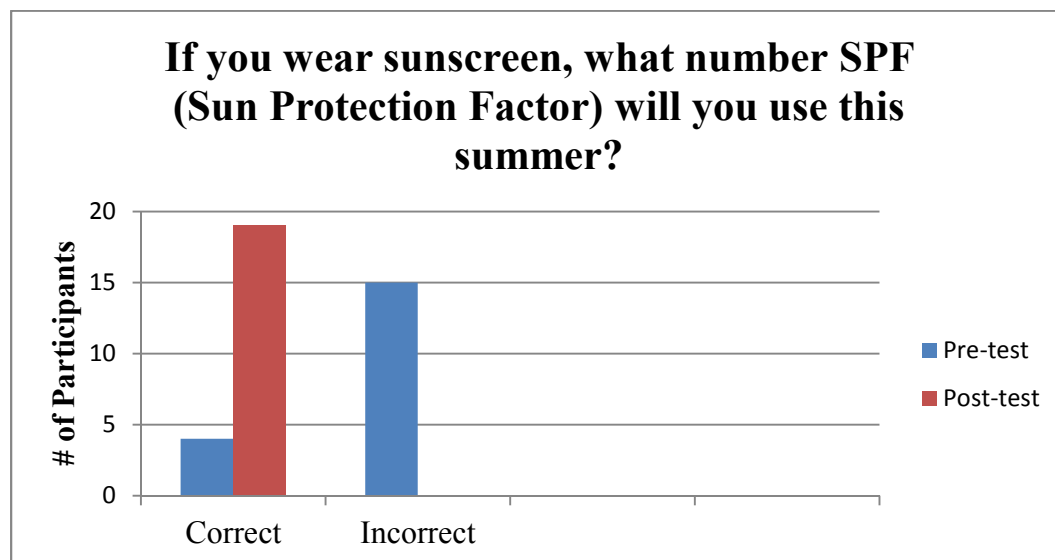
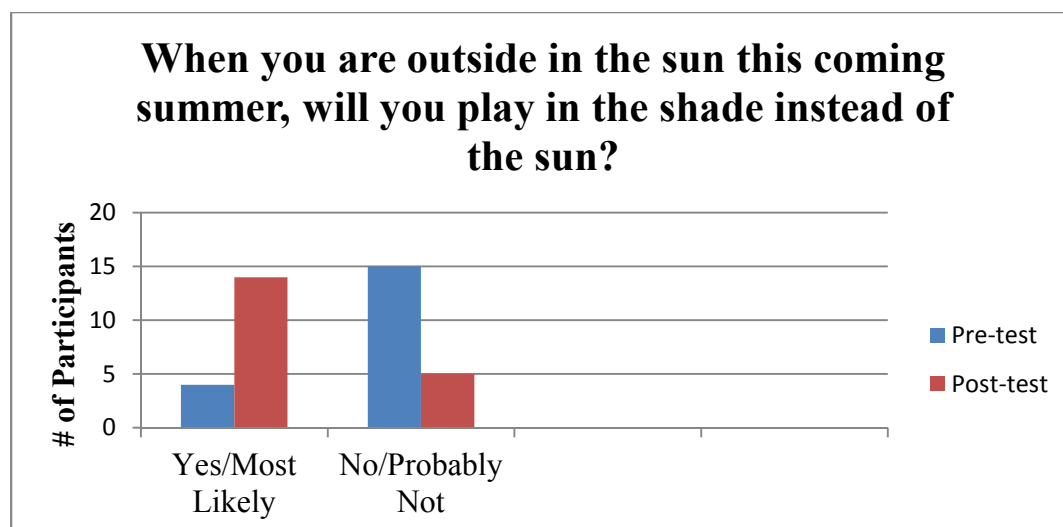
Intended Practice Change Questions	Fisher Exact Test Results
This summer will you try and play in the shade?	p=0.002
Will you put on sunscreen when you go outside this summer?	p=0.001
Will you wear a hat?	p=0.723
Will you wear long sleeves?	p=0.232
Will you wear sunglasses?	p=0.068
How many hours a day will you spend outside between 10a to 4p?	p<0.001

**Figure 2: Current Rural 6<sup>th</sup> Grade Sun Practices****Figure 3: Current Sun Protection of 6<sup>th</sup> Graders**

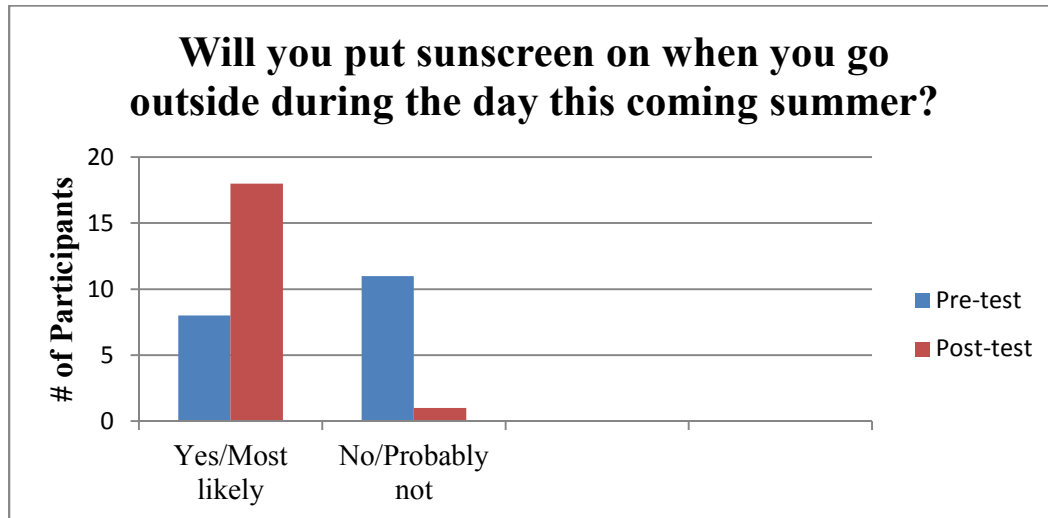
**Figure 4: Tanning Perception**

**Figure 5: Pre- and Post-test comparison of a knowledge question. Correct responses included both: Using Sunscreen, and Wearing a Shirt and Hat Outside. Incorrect responses: Eating Cereal.**



**Figure 6: SPF level to wear in the sun****Figure 7: Intent to play in the shade results**

**Figure 8: Future use of sunscreen protection**





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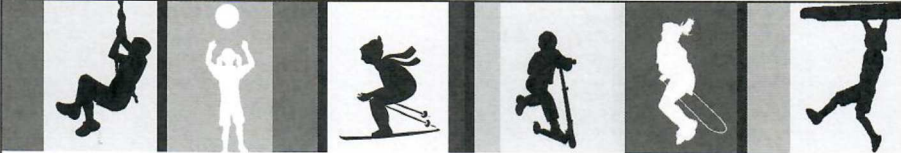
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## Appendix A: SunWise Pre-test Survey Pages 1 &amp; 2

OMB Control No. 2060-0439 Expiration Date: 02/28/2011 POST-TEST




**W**e have a few questions we want you to answer about yourself and the sun. Thank you for answering these questions. Please use a pencil to fill in the circle for each answer you choose. If you want to change your answer choice, be sure to erase your first choice completely.

- What month is it?
 

<input type="radio"/> January	<input type="radio"/> February	<input type="radio"/> March	<input type="radio"/> April	<input type="radio"/> May	<input type="radio"/> June
<input type="radio"/> July	<input type="radio"/> August	<input type="radio"/> September	<input type="radio"/> October	<input type="radio"/> November	<input type="radio"/> December
- How old are you?  8  9  10  11  12  13  14
- Are you a boy or a girl?  Boy  Girl
- What is the color of your hair?  Blond  Red  Brown  Black
- Does your skin burn easily in the sun?  Yes  No  I don't know
- What are some of the ways you can keep your skin safe from the sun?  
\* Please fill in as many circles as you need to answer this question.
 

<input type="radio"/> Eating cereal	<input type="radio"/> Using sunscreen	<input type="radio"/> Wearing a shirt and hat outside
-------------------------------------	---------------------------------------	-------------------------------------------------------


- When do you have to use the most sun protection?  
When the UV (Ultraviolet) Index is:  1  5  10 or higher  I don't know
- You can get a sunburn on a cloudy day.  True  False
- You only need to wear sunscreen when you are at the beach or pool.  True  False
- Keeping your skin safe from the sun is:  Hard to do  Not too hard, not too easy  Easy to do
- Some of the reasons why I do NOT always wear sunscreen when I'm outside are because:  
\* Please fill in as many circles as you need to answer this question.
 

<input type="radio"/> It takes too long to put on sunscreen.	<input type="radio"/> It's hard to put sunscreen on my whole body.
<input type="radio"/> I forget to put on sunscreen.	<input type="radio"/> I don't have any sunscreen.
<input type="radio"/> It stings my eyes.	<input type="radio"/> None—I always wear sunscreen!
<input type="radio"/> Sunscreen feels greasy on my skin.	
- Some of the reasons why I do NOT always wear a hat when I'm outside are because:  
\* Please fill in as many circles as you need to answer this question.
 

<input type="radio"/> I forget to bring a hat.	<input type="radio"/> I don't like to wear a hat.	<input type="radio"/> I don't have a hat.
<input type="radio"/> It's too hot to wear a hat.	<input type="radio"/> None—I always wear a hat!	
- Do you like to get a tan?  Yes  No
- Do you think people look healthier with a tan?  Yes  No

CONTINUED ON THE BACK—PLEASE TURN OVER.

**SunWise**  
a program that radiates good ideas  
[www.epa.gov/sunwise](http://www.epa.gov/sunwise)

APPROVED: ICF/Caliber IRB on 4/7/08

OMB Control No. 2060-0439 Expiration Date: 02/28/2011

15. When you wear a bathing suit outside, what are all of the places that you put on sunscreen?

\* Please fill in as many circles as you need to answer this question.

- My face       My arms       My shoulders       My legs       My back  
 My ears       My stomach       My neck       I don't put it on

16. Have you ever reminded a:

- Friend to put on sunscreen?       Yes       No  
 Sibling (brother or sister) to put on sunscreen?       Yes       No  
 Parent or guardian to put on sunscreen?       Yes       No  
 Parent or guardian to put sunscreen on you?       Yes       No

17. When you are outside in the sun this coming summer, will you try to play in the shade instead of in the sun?

- Yes       Most likely       Probably not       No

18. Will you put sunscreen on when you go outside during the day this coming summer?

- Yes       Most likely       Probably not       No

19. Does your school announce the UV Index?       Yes       No

### When you were outside in the sun last summer:

20. Did you wear a hat?

- Never       Rarely       Sometimes       Often       Always

21. Did you wear a long-sleeved shirt?

- Never       Rarely       Sometimes       Often       Always

22. Did you wear sunglasses?

- Never       Rarely       Sometimes       Often       Always

23. Did you wear sunscreen?

- Never       Rarely       Sometimes       Often       Always

24. If you wore sunscreen, what number sunscreen or SPF (sun protection factor) did you use?

- Less than 15       15-29       30 or higher       I don't know

25. How many times did you get sunburned?

- None       One or two       Three or more

26. If you got a sunburn, how many of the sunburns were painful?

- None       One or two       Three or more       I did not get sunburned

27. How many days a week did you spend outside during the day between 10 AM and 4 PM?

- 0-1 day per week       2-3 days per week       4-5 days per week       6-7 days per week

28. How many hours a day did you spend outside during the day between 10 AM and 4 PM?

- Less than 1 hour per day       1-2 hours per day       3-4 hours per day       5-6 hours per day

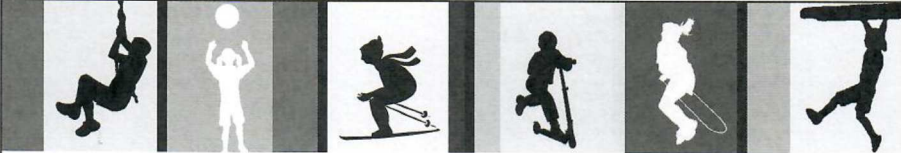


This survey asks questions about how to keep your skin safe from the sun. You do not have to answer any questions that you do not want to. You can stop being part of the study at any time. To keep your answers private, your name will not be on the survey. This survey should take about 10 minutes to fill out.

**SunWise**  
 a program that radiates good ideas.  
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## Appendix B: SunWise Post-test Survey Pages 1 &amp; 2

OMB Control No. 2060-0439 Expiration Date: 02/28/2011 POST-TEST




**W**e have a few questions we want you to answer about yourself and the sun. Thank you for answering these questions. Please use a pencil to fill in the circle for each answer you choose. If you want to change your answer choice, be sure to erase your first choice completely.

- What month is it?
 

<input type="radio"/> January	<input type="radio"/> February	<input type="radio"/> March	<input type="radio"/> April	<input type="radio"/> May	<input type="radio"/> June
<input type="radio"/> July	<input type="radio"/> August	<input type="radio"/> September	<input type="radio"/> October	<input type="radio"/> November	<input type="radio"/> December
- How old are you?  8  9  10  11  12  13  14
- Are you a boy or a girl?  Boy  Girl
- What is the color of your hair?  Blond  Red  Brown  Black
- Does your skin burn easily in the sun?  Yes  No  I don't know
- What are some of the ways you can keep your skin safe from the sun?  
\* Please fill in as many circles as you need to answer this question.
 

<input type="radio"/> Eating cereal	<input type="radio"/> Using sunscreen	<input type="radio"/> Wearing a shirt and hat outside
-------------------------------------	---------------------------------------	-------------------------------------------------------


- When do you have to use the most sun protection?  
When the UV (Ultraviolet) Index is:  1  5  10 or higher  I don't know
- You can get a sunburn on a cloudy day.  True  False
- You only need to wear sunscreen when you are at the beach or pool.  True  False
- Keeping your skin safe from the sun is:  Hard to do  Not too hard, not too easy  Easy to do
- Some of the reasons why I do NOT always wear sunscreen when I'm outside are because:  
\* Please fill in as many circles as you need to answer this question.
 

<input type="radio"/> It takes too long to put on sunscreen.	<input type="radio"/> It's hard to put sunscreen on my whole body.
<input type="radio"/> I forget to put on sunscreen.	<input type="radio"/> I don't have any sunscreen.
<input type="radio"/> It stings my eyes.	<input type="radio"/> None—I always wear sunscreen!
<input type="radio"/> Sunscreen feels greasy on my skin.	
- Some of the reasons why I do NOT always wear a hat when I'm outside are because:  
\* Please fill in as many circles as you need to answer this question.
 

<input type="radio"/> I forget to bring a hat.	<input type="radio"/> I don't like to wear a hat.	<input type="radio"/> I don't have a hat.
<input type="radio"/> It's too hot to wear a hat.	<input type="radio"/> None—I always wear a hat!	
- Do you like to get a tan?  Yes  No
- Do you think people look healthier with a tan?  Yes  No

CONTINUED ON THE BACK—PLEASE TURN OVER.

**SunWise**  
a program that radiates good ideas  
[www.epa.gov/sunwise](http://www.epa.gov/sunwise)

APPROVED: ICF/Caliber IRB on 4/7/08



15. When you wear a bathing suit outside, what are all of the places that you put on sunscreen?

\* Please fill in as many circles as you need to answer this question.

- My face     My arms     My shoulders     My legs     My back  
 My ears     My stomach     My neck     I don't put it on

16. Have you ever reminded a:

- Friend to put on sunscreen?     Yes     No  
 Sibling (brother or sister) to put on sunscreen?     Yes     No  
 Parent or guardian to put on sunscreen?     Yes     No  
 Parent or guardian to put sunscreen on you?     Yes     No

17. When you are outside in the sun this coming summer, will you try to play in the shade instead of in the sun?

- Yes     Most likely     Probably not     No

18. Will you put sunscreen on when you go outside during the day this coming summer?

- Yes     Most likely     Probably not     No

19. Does your school announce the UV Index?     Yes     No

When you <sup>are</sup> were outside in the sun <sup>this</sup> last summer:

<sup>Will</sup> 20. Did you wear a hat?

- Never     Rarely     Sometimes     Often     Always

<sup>Will</sup> 21. Did you wear a long-sleeved shirt?

- Never     Rarely     Sometimes     Often     Always

<sup>Will</sup> 22. Did you wear sunglasses?

- Never     Rarely     Sometimes     Often     Always

<sup>Will</sup> 23. Did you wear sunscreen?

- Never     Rarely     Sometimes     Often     Always

24. If you wore sunscreen, what number sunscreen or SPF (sun protection factor) <sup>will</sup> did you use?

- Less than 15     15-29     30 or higher     I don't know

25. How many times <sup>will</sup> did you get sunburned?

- None     One or two     Three or more

26. If you got a sunburn, how many of the sunburns <sup>will be</sup> were painful?

- None     One or two     Three or more     I did not get sunburned

27. How many days a week <sup>will</sup> did you spend outside during the day between 10 AM and 4 PM?

- 0-1 day per week     2-3 days per week     4-5 days per week     6-7 days per week

28. How many hours a day <sup>will</sup> did you spend outside during the day between 10 AM and 4 PM?

- Less than 1 hour per day     1-2 hours per day     3-4 hours per day     5-6 hours per day



This survey asks questions about how to keep your skin safe from the sun. You do not have to answer any questions that you do not want to. You can stop being part of the study at any time. To keep your answers private, your name will not be on the survey. This survey should take about 10 minutes to fill out.

**SunWise**  
 a program that radiates good ideas  
[www.epa.gov/sunwise](http://www.epa.gov/sunwise)

**Appendix C: Skin Cancer/Sun Behavior Questionnaire Permission**

Geller, Alan Charles [ageller@hsph.harvard.edu]  
Actions

To:

Jeanette Miller

Attachments:

[SunWise\\_Survey\\_POST\\_v14.pdf \(169 KB\)](#)[Open as Web Page]

Tuesday, January 08, 2019 5:51 PM

Dear Jeanette-

Thanks for your inquiry. Here goes with the survey that we used. I hope that your study works out well.

Alan

**Appendix D: Onaga School Exclusion Form**

**USD 322 ONAGA SCHOOLS  
EXCLUSION FORM**

Parents:

On April 16<sup>th</sup> 2019 at 8:30 am, Jeanette Miller KU DNP student will be presenting a one hour sun education and protection activity to the sixth grade class. This is a SunWise PowerPoint and interactive education project intended to increase the students' knowledge on sun protection. A pre and post questionnaire to assess knowledge will be given. If you do not want your child to participate please sign, date and return this form to school and your child will be excused from this instruction.

I request that my child \_\_\_\_\_ be excused from this instruction.

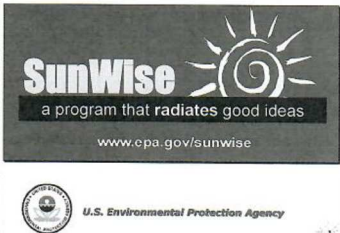
Printed name of child

Date: \_\_\_\_\_





\_\_\_\_\_  
Parent/guardian printed name

\_\_\_\_\_  
Parent/guardian signature

## Appendix E: SunWise PowerPoint



### The Sun


<p><b>Good</b></p> <p>Keeps Us Warm </p> <p>Helps Plants Grow </p>	<p><b>Bad</b></p> <p>Causes Sunburns </p> <p>Makes Our Skin Wrinkle </p>
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### The Sun...

...is necessary for life on Earth.

It helps plants grow, and provides warmth and light.

Sunlight also helps people to be happy and healthy.



### Be SunWise



### The Sun

<p><b>Good</b></p> <p>Keeps Us Warm</p> <p>Helps Plants Grow</p> <p>Makes Vitamin D</p> <p>Kills Germs</p> <p>Makes Us Feel Good</p> <p>Gives Us Light</p>	<p><b>Bad</b></p>
------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------

### The Sun...

...produces light and warmth but also Ultraviolet (UV) radiation. UV radiation cannot be seen or felt.

It is UV radiation, not the warmth or brightness of the sun, that causes changes to skin color, damage to eyes, and other bad health effects.



### What do you know about the Sun?



### The Sun

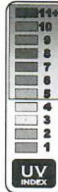
<p><b>Good</b></p>	<p><b>Bad</b></p> <p>Causes Sunburns</p> <p>Makes Our Skin Wrinkle</p> <p>Causes Skin Cancer</p> <p>Causes Eye Damage</p>
--------------------	---------------------------------------------------------------------------------------------------------------------------

### UV radiation is not always the same; it changes based on...

- Time of day
- Time of year
- Location
- Altitude
- Weather
- Reflection
- Ozone Layer




### How do we measure UV radiation levels?



We use the UV Index Scale. Reported on a scale of 1 -11+.

*Take special care when the UV Index is 5-6 or higher.*



### Sun Safety Action Steps

## Limit Time in the Midday Sun



The sun's rays are strongest between 10 am and 4 pm.

Limit exposure to the sun during these hours.

### Sun Safety Action Steps

## Use Sunscreen



Use sunscreen of SPF 15+ generously and reapply every 2 hours, or after working, swimming, playing, or exercising outdoors.

## How Can You Become SunWise?



### Sun Safety Action Steps

## Seek Shade




Staying under cover is one of the best ways to protect yourself from the sun.

But remember, shade structures do not offer complete sun protection.

### Sun Safety Action Steps

## Wear a Hat




A hat with a wide brim offers good sun protection for your eyes, ears, face, and the back of your neck.

### Sun Safety Action Steps

 Limit Time in the Midday Sun	 Wear Sunglasses
 Seek Shade	 Use Sunscreen
 Cover Up	 Avoid Tanning Parlors
 Wear a Hat	 Watch for the UV Index

### Sun Safety Action Steps

## Cover Up



Wearing long sleeves and long pants is a good way to protect your skin from the sun's UV rays.


### Sun Safety Action Steps

## Wear Sunglasses



Sunglasses that provide 99 to 100 percent UV protection will greatly reduce sun exposure that can lead to eye damage.

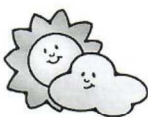
**Sun Safety Action Steps**



**Avoid Tanning Parlors**


The light source from sunbeds and sunlamps damages the skin and unprotected eyes. It is a good idea to avoid artificial sources of UV light.

**True or False?**



**You can get sunburned on a cloudy day.**

**True or False?**




**You only need to wear sunscreen when you are at the beach.**

**FALSE**

You do not have to be sunbathing to get a damaging dose of the sun. Everyday exposure to the sun without sunscreen can damage your skin.


**Sun Safety Action Steps**



**Watch for the UV Index**

The UV Index provides important information to help you plan your outdoor activities in ways that prevent overexposure to the sun. The UV Index is issued daily across the United States.

**True or False?**



**You can get sunburned on a cloudy day.**

**TRUE**

Even on a cloudy day, many of the sun's rays can still reach the Earth's surface.

**True or False?**




**Sunscreen with a SPF of LESS than 15 is enough to protect my skin.**


**Are You SunWise?**



**True or False?**



**You only need to wear sunscreen when you are at the beach.**



**True or False?**



**Sunscreen with a SPF of LESS than 15 is enough to protect my skin.**

**FALSE**

Use Sunscreen with **SPF 15 or Higher**. Remember to put on enough sunscreen to protect your skin.

## Appendix F: SunWise UV Frisbee activity

### Why Worry About Too Much Sun? (UV Frisbee® Fun)

**Estimated time:**

15-20 minutes

**Suggested Audience Size:**

15-30

**Supplies:**

- UV-Sensitive Frisbee
- Masking tape
- Sunblock
- Marker
- SPF's (4, 8, 15, 30)
- Newspaper
- Plastic shower cap

**Directions:**

Cover the Frisbee with the clear plastic shower cap.  
(DO NOT APPLY THE SUNSCREEN DIRECTLY TO THE FRISBEE).

- Apply small circles of sunscreen (different SPF levels: 4/8/15/30).
- Use masking tape and marker to identify each SPF level.
- Ask students to predict what they think will happen where each SPF sunscreen was applied when the Frisbee is exposed to the sunlight.
- Cover the Frisbee with newspaper and take it outside
- Uncover the Frisbee and have students observe
- The unprotected area of the UV Frisbee will change color
- The circles with SPF 4 will change color quickly
- The circles with SPF 15 and greater will not change color
- Have students explain what occurred.

Retrieved from: [www.epa.gov/sunwise](http://www.epa.gov/sunwise)

**Appendix G: Permission Letter from School to Implement QI Project Intervention****USD 322 Onaga Schools**

To whom it may concern:

Jeanette Miller has permission to implement her KUMC quality improvement Doctor of Nurse Practitioner project at Onaga Elementary/Junior High School in Onaga, KS. on April 16, 2019.

Thank you,

Ty Poell



## Appendix H: Human Subjects Quality Improvement Confirmation



### KUMC HUMAN SUBJECTS COMMITTEE

#### REQUEST FOR QUALITY IMPROVEMENT/QUALITY ASSURANCE DETERMINATION

***\*THIS FORM MUST BE TYPED\****

<b>Project Leader:</b> Jeanette Miller	
<b>Department:</b> University of Kansas School of Nursing	
Email: jmiller17@kumc.edu	Phone: 785-554-7026
<b>Alternate Contact Person</b> (e.g., Project Coordinator): Dr. Janet Pierce	
Email: jpierce@kumc.edu	Phone: 913-588-1663

**Project Title:**

Improving Skin Protection Practices in Rural Kansas 6<sup>th</sup> Graders

**Project Number, Version and/or Date:**

February 2019

**1. Briefly state the purpose of the proposed project. (Attach project plan if available.)**

Skin cancer is a common cancer in the United States and often preventable with the use of sun modification behaviors (sunscreen, long sleeves, hats and sunglasses) (Centers for Disease Control [CDC], 2018). Prevention is a key to decreasing skin cancer incidence, its associated morbidity and healthcare costs. The overall aim of this DNP project is to improve skin protection practices in 6th graders in a rural Kansas town. Therefore, the purpose of this DNP project is to provide a quality improvement sun protection education program to 6th graders in a rural Kansas school. This project will provide an opportunity to assess the rural Kansas preadolescent's perception regarding skin protection use, barriers to skin protection practices and behavior change after a skin protection and education program. The intent of this DNP project is to not produce new knowledge but to utilize an established sun education program (SunWise) to implement change.

**2. Describe the research that has already demonstrated the effectiveness of your intervention. (Cite research and/or attach documentation about the national program or standard you are implementing)**

Revised 10/4/16

One of the Healthy People 2020 initiatives is to promote educational interventions/behaviors to prevent the skin damaging effects of ultraviolet radiation (Healthy People 2020, 2018). In addition, the Surgeon Generals Call to Action (2014) proposed sun protection programs in the school setting as a potential intervention to benefit school aged children. A low rate of skin protection education can be a contributing factor of sun damage especially in rural areas where there is greater exposure to the sun with farming, outdoor activities and low resources for educational interventions (Chun, Ohanehi, & Redican, 2015). There is an overall lack of sun safety intervention within schools in general with the study by Jones and Guy (2017) stating that sun protection was uncommon and sun safety varied by region in the United States.

The SunWise program was developed by the Environmental Protection Agency (EPA) in 1998 for use in schools across the U.S. and currently is being administered by the National Environmental Education Foundation (NEEF) with support from Johnson & Johnson Consumer Inc. (SunWise, 2019). An economic feasibility study on the SunWise program was completed indicating that even modest improvements in sun protection behaviors translates into future savings in costs associated with skin cancer treatment, loss of productivity, and mortality (Kyle et al., 2008).

**3. What types of data are needed for the project?**

This project will utilize qualitative data and approval has been given by the SunWise program. The SunWise questionnaires/surveys will not include the names of the student or any identifiers. A pre-test/post-test design will be used to test the degree of change occurring after the proposed educational sun protective behavior intervention. This DNP project will use identical color coded pre-and post questionnaire/surveys. Each student will be assigned their own unique identification number to link the pre and post questionnaires to the same participant and will stay anonymous. The survey is an established SunWise demographic, multiple choice, yes/no and Likert type questions that measure the preadolescent's knowledge of sun protective behaviors and skin cancer knowledge. All surveys will be completed with pencil and paper. The SunWise survey includes 28 questions, was pilot tested on children 6-7 years old, and takes less than 10 minutes to complete (Geller et al., 2003). The SunWise educational program underwent a multidisciplinary review by a panel of educators, curriculum specialists, and skin cancer researchers (Geller, Rutsch, Kenausis, Selzer, & Zhang, 2003).

**4. Do you need access to identifiable patient records to complete the project?**

- NO**  
 **YES**

If yes, who holds the records? \_\_\_\_\_

If yes, which patient identifiers or demographics are needed for the project?  
 \_\_\_\_\_

**5. Which descriptions best fits your project? *Check all that apply:***

- Determine if a previously-implemented clinical practice improved the quality of patient care
- Evaluate or improve the local implementation of widely-accepted clinical or educational standards that have been proven effective at other locations
- Gather data on hospital or provider performance for clinical, practical or administrative uses
- Conduct a needs assessment to guide future changes in local health care delivery or to support other improvements at KUMC
- Perform an analysis to characterize our patient population/clients to improve quality of services
- Implement programs to enhance professional development for providers and trainees
- Measure local efficiency, cost or satisfaction related to standard clinical practices
- Develop interventions or educational strategies that improve the utilization of recognized best practices
- Implement strategies to improve communication within our local healthcare environment
- Improve tools for patients that promote education, health literacy or treatment plan compliance

6. **Does your project involve any of the following aspects?** *Check all that apply:*

- Randomizing participants into two or more groups
  - Student/residents/trainees are randomized
  - Patients are randomized
  - Healthcare providers are randomized
  - Units of the hospital are randomized
  - Other *Specify:* \_\_\_\_\_
- Surveying a patient population
- Developing clinical practice guidelines
- Developing new curriculum recommendations
- Developing or refining a new assessment tool
- Implementing a novel approach to care that may improve patient outcomes

7. **Which institutions are involved in the project?**

- KUMC only
- Other institutions List rural grade school in Northeastern Kansas

8. **Which individuals or groups will receive the results of your project?**

- Internal department personnel
- Hospital representatives

- University representatives
- Presentation/publication\*
- Other Specify \_\_\_\_\_

9. How will your results be used to implement local improvements?

**Data evaluation of the descriptive statistics and item analysis will be used to describe the resulting pre- and post-data on the sun protection practices and skin cancer knowledge educational intervention. This will be shared with the school principle, interested staff, and 6<sup>th</sup> grade teachers. In rural Kansas, the school district does not have an implemented sun protective education program. The Project Director will work closely with the 6<sup>th</sup> grade teacher to evaluate if the project has any impact on sun exposure in these students. The project director will also act as source of information to promote the need for sun education to bring about a change in the school promoting sun protective behaviors.**

\_\_\_\_\_  
Signature\*\*

\_\_\_\_\_  
Date

\_\_\_\_\_  
Type/Print Name

\*Any presentation or publication resulting from this project should explicitly state that it was undertaken as quality improvement.

\*\*Ink signature or email from the project leader is required.

<b>FOR OFFICE USE ONLY</b>	
<b>Quality Improvement Determination Acknowledged. IRB review is not required.</b>	
_____ HRPP Official	
_____ Signature	_____ Date