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## Improving sunscreen compliance and awareness of skin cancer and the effects of the sun in adolescents and young adults: A quality improvement project.

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Improving sunscreen compliance and awareness of skin cancer and the effects of the sun in  
adolescents and young adults: A quality improvement project.

A Scholarly Project Presented to the Faculty of the  
Nicole Wertheim College of Nursing and Health Sciences

Florida International University

In partial fulfillment of the requirements

For the Degree of Nursing Practice

By

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Approval Acknowledged:

\_\_\_\_\_, DNP Program Director

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

**Abstract**

**Background:** Skin cancer is the most common cancer in the United States, with 1 in 5 Americans developing it at one point in their lifetime. Skin cancer is predominately caused by accumulation of sun exposure throughout one's life. The main issue arises as sun's damage is not immediately visible. Since damage from the sun's ultraviolet rays occurs beneath the surface of the skin, invisible to the naked eye, it leads a person's unawareness of the cumulative damage the sun has caused. UV rays can damage unprotected skin in as little as 15 minutes, and can, occur not only when directly outside, but also through windows, such as inside a car or any window the sun shines through. More than half a person's lifetime UV exposure occurs during adolescence. The exposure to intense UV rays in adolescents is highly associated with an increase in developing skin cancer. Just 5 sunburns between the ages of 15-20 increases one's non-melanoma risk by 68% and melanoma risk by 80%.

**Objective:** The main objective of the QI project was to assess the impact of an educational video focused on the negative effects of the sun, types of skin cancer, benefits of sunscreen and recommended sunscreen usage on adolescence and young adults.

**Methods:** Data was collected from a sample of 20 patients, ages 13-30 from a dermatology office. The methods included a pre-test survey, an educational video intervention, and post-test survey design. The pre-test and post-test survey responses were analyzed and compared.

**Findings:** The pre-test to post-test knowledge significantly increased after the educational intervention. At the end of the study, 100% of participants reported that they would wear sunscreen daily, 55% of participants reported they would perform monthly self-skin exams, and 95% of participants reported they would get annual full body exams by a dermatologist.

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## **I. Introduction**

Skin cancer is the most common form of cancer in the United States, as 1 in 5 Americans will develop skin cancer at some point in their lifetime (“Melanoma of the Skin Statistics”, 2021). Skin cancer is also one of the most preventable types of cancer. According to the American Academy of Dermatology (2021), more than 9,500 people in the United States are diagnosed with skin cancer every day. Skin cancer is caused by the accumulation of repetitive sun exposure throughout one’s lifetime. Increased sun exposure in childhood and adolescence is highly associated with an increased risk of a person developing three varying degrees of skin cancer: basal cell carcinoma, squamous cell carcinoma and melanoma. Furthermore, multiple sunburns during adolescence and young adulthood increases the odds of developing skin cancer later in life. Research has shown that a history of 5 or more sunburns between the ages of 15-20 increases one’s nonmelanoma risk by 68% and melanoma risk by 80% (American Academy of Dermatology Association, 2021).

A common misconception is that skin cancer, specifically melanoma, only occurs in older adults. However, it is increasingly found in adolescents and young adults, making melanoma one of the most common cancers in people younger than 30. Melanoma in younger adults has a gender-based difference with females showing a higher incidence compared to males. In comparison, after age 30, melanoma is more common in men overall (American Cancer Society, 2021).

### **Problem Statement**

The main problem involves the lack of awareness individuals, specifically adolescents and young adults have when it comes to the damage caused by ultraviolet rays, both natural and artificial. Adolescents and young adults do not realize that damage to the skin happens daily from sun exposure not only while outside, but also through windows in a car, home or office.

Furthermore, because the damage is not immediately seen or known to be a future issue, they are not interested in using daily sunscreen. The lack of knowledge about skin cancer in this specific age range compounds the problem. A study of this age group conducted in 2016 by Ugurlu et al., showed that 62.2% had absolutely no knowledge of skin cancer. An additional problem is the belief that skin cancer does not affect this age group. This causes adolescents and young adults to not use sunscreen or wear protective clothing, perform self-skin exams, or get yearly full body exams. The study performed by Ugurlu et al., (2016), showed that only 4.5% of the study participants performed self-skin examinations, one of the most beneficial preventative measures to detect skin cancer. While more than half of a person's lifetime skin accumulation and damage from UV rays occurs during adolescence, there are few studies identifying ways to promote sun protection practices among adolescents (Cassel et.al., 2018).

### **Scope of the problem**

The problem exists because skin cancer is the most common form of cancer in the United States with over 5.4 million cases of skin cancer needing to be treated yearly. The increase in skin cancer has led to increased deaths throughout the United States as well as significant healthcare costs. These costs have continuously been increasing each year as more Americans are diagnosed with skin cancer. According to the most recent available statistics, \$8.1 billion dollars was spent on nonmelanoma skin cancer treatment in 2011. (Chen, Kempton & Rao, 2016).

### **Consequences of the problem**

The consequence of not addressing this problem is potentially fatal. If sunscreen and skin cancer education is started at a younger age, it has the potential to save countless lives and billions of dollars. Just 5 or more sunburns can potentially double the risk of an individual

developing melanoma, leading to the importance of early education of the benefits of sunscreen usage and the detrimental consequences of continued unprotected UV exposure in adolescence and young adults. Another factor of not addressing skin cancer education and prevention at an early age is that as the number of skin cancer cases increase, the healthcare system will be strained and hard-pressed to treat such increased cases of skin cancer and the overall healthcare costs will increase significantly.

### **Significance of this problem**

If skin cancer education and sunscreen usage among our younger population is not addressed, the number of skin cancer deaths and cancer related medical problems will rise and there will also be an appreciable rise in healthcare costs and facility overload when these individuals reach an age when cancer is more likely.

## **II. Summary of Literature**

### **Search Strategy**

The literature search was done through databases such as Cumulative Index to Nursing and Allied Health Literature (CINAHL) and National Center for Biotechnology Information (NCBI). The review was conducted to find primary research studies, systematic reviews, and meta-analysis articles relevant to the DNP project. The keywords included in the search were: sunscreen, sunscreen education, skin cancer, prevention of skin cancer, skin cancer awareness, melanoma and non-melanoma, adolescents, young adults and educational video. The search limitations included the publication year from 2016-present, English language, full text, and scholarly peer reviewed. The initial search on CINAHL resulted in 53 articles. After reading the abstract of the initial articles, 12 articles remained relevant to the PICO question. The initial search on NCBI resulted in 224 articles, with 4 remaining after an initial review.



## **Literature Review**

### **Prevalence and Risk Factor of Skin Cancer**

Skin cancer is the most common cancer, and nearly five million diagnoses made yearly in the United States (Heckman et al., 2019). The incidence of skin cancer in the United States has increased 3% annually since 2004 with the primary risk factor being unprotected exposure to ultraviolet radiation (Cassel et al., 2018). According to the American Academy of Dermatology Association (2021), approximately 9,500 people in the United States are diagnosed with skin cancer daily. Nonmelanoma skin cancer, which includes basal cell carcinoma and squamous cell carcinoma, impacts more than 3 million Americans a year. Melanoma, which is the most fatal type of skin cancer, has increased in the pediatric population annually at 2% per year since 1973 according to the Dana-Farber Cancer Institute (“Melanoma in Children and Teens” 2020). Melanoma is accountable for more than 9,000 skin cancer deaths each year, with the incidence and mortality rates projected to steadily increase in the United States through 2030 (Bruce & Cowen, 2020). It is estimated that 106,110 new cases of melanoma will be diagnosed in 2021. (Siegel, Miller, Fuchs & Jemal, 2021).

Melanoma is the second leading type of cancer in adolescents and young adults between 15-29 years old. The incidence of melanoma increases drastically with age, from 1.1 per million in 1-to-4-year-olds to 10.4 per million in 15-19-year-olds (Saiyed, Hamilton & Austin, 2017). Each year, approximately 300 children in the United States are diagnosed with melanoma. In recent decades, there has been a significant increase in the incidence of melanoma in girls ages 15-19 due to the fact girls are more likely to sunbathe and use indoor tanning beds compared to boys (Dana-Farber Cancer Institute, 2021).

The development of skin cancer is caused by both modifiable and nonmodifiable risk factors. The most common modifiable risk factor is exposure to natural and artificial ultraviolet light. Ultraviolet exposure stimulates the melanocytes to produce melanin which darkens the skin, making it appear tanned, indicating damage to the skin, skin cells and DNA (Watson, Holman, & Maguire-Eisen, 2016). Other modifiable risk factors include unprotected exposure to UVA & UVB rays, sunburns, sunburns in childhood, indoor tanning bed use, and frequency of tanning. Non-modifiable risk factors include genetics, such as naturally fair skin tone, blonde or red hair, light colored eyes, freckles, and family history of melanoma.

### **Perception**

Adolescents have inaccurate skin cancer risk perceptions leading to higher ultraviolet radiation exposure and diminished prevention practices into adulthood (Cassel et al., 2018). Adolescents and young adults have a misconception about tan skin and believe it is considered healthy and provides the body protection from sun damage. In a study performed by Julian, Thorburn & Geldhof (2020), 20% of college students believe that having a base tan before sun exposure is protection against skin cancer. Furthermore, college students who participated in the study believed that tanning has inherent health benefits such as, providing “base protection” and “naturally” supporting the production of vitamin D needed for a healthy body (Julian, Thorburn & Geldhof, 2020).

Cassel et al., (2018), reports that high school students’ perceptions of good health include behaviors like regular physical activity, adequate sleep; and healthy people were considered to have tanned good-looking skin. Most adolescents were aware of the negative consequences of skin cancer, but believed it occurred later in life, and were unaware of the direct connection between ultraviolet radiation and skin cancer. Additionally, both male and female adolescents

revealed they perceived sunscreen as sticky, greasy, smelly and uncomfortable when perspiring, and protective clothing as unattractive or unnecessarily hot (Cassel et al., 2018). Cassel et al., concluded that students' tanning attitudes were influenced by self-perceptions regarding their own complexion.

Due to the perception that tanned skin is considered “attractive” and “good looking” many adolescents and young adults deliberately use a sunscreen with a low SPF and either delay sunscreen application or completely forgo the application of sunscreen to get a tan (Hubbard et al., 2018). According to Hubbard et al., (2018), there is good reason to believe that educating and promoting sunscreen use in the adolescent curriculum can provide long term benefits and further advance compliance of sunscreen usage.

According to Venning et al., (2018), risk perception plays a minimal role in sun exposure behaviors. When assessing absolute cognitive risk perception, the majority of individuals who are considered high risk, such as those having red hair, blonde hair, light eye color and more than 50 moles did not self-assess as high risk (absolute cognitive risk) (Venning, Abbott, Thomas & Fernandez- Penas, 2018). Additionally, those who considered themselves high risk for developing skin cancer did not show any protective behaviors. In comparison, those who showed no concern about the risk skin cancer (absolute affective risk) reported sun safety behaviors (Venning, Abbott, Thomas & Fernandez- Penas, 2018).

Many people believe that sunscreen has a negative effect on overall health. They believe that sunscreen has more risks due its chemical ingredients and side effects compared to its beneficial attributes and can cause other types of cancers (Lindstrom et al., 2019). Because of this belief that sunscreen is harmful and full of carcinogens, many do not apply sunscreen, which in turn leads to the development of skin cancer.

## **Prevention and Education**

Skin cancer has the highest potential to be prevented among all cancers. There is no reason studies should be reporting data of under 50% sunscreen usage among the youth population (Mirzaei-Alavijeh, Gharibnavaz & Jalilian, 2019). The goal is to educate adolescents and young adults to increase their knowledge and awareness of skin cancer. By making this age group aware of the negative effects of the sun, we can encourage modification of their behaviors to incorporate sun protective actions into everyday habits. This should reduce, the incidence of skin cancer in this age group as well as in older adults. When educating this specific age group, it is essential to determine how to portray the information in a way that will capture their attention. A study conducted by Tuong & Armstrong (2014) revealed that high-school students are more significantly impacted by visual learning such as pictures and appearance-based videos.

The most preventable cause of skin cancer is overexposure to ultraviolet light, either directly from the sun or artificial sources such as tanning beds (“Basic Information About Skin Cancer”, 2021). Thus, through sunscreen and protective clothing usage, skin cancer can be prevented or appreciably decreased. By making sun protective behaviors such as applying sunscreen an everyday habit, it will help keep the skin healthy, avoid sunburns, and lower one’s skin cancer risk. The CDC (2021) recommends usage of a broad-spectrum sunscreen with an SPF of 15 or higher. As sunscreen wears off, it is recommended to re-apply sunscreen after 2 hours if out in the sun for an extended period.

By performing monthly self-skin exams, an individual can become familiar with their moles and notice any changes in them or new moles promptly. The ABCDE acronym provides a guideline for individuals while performing monthly self-skin exams and is extremely beneficial in detecting new or abnormal moles. The A stands for asymmetry, the shape of one half of the

mole does not match the other, the B stands for border, the edges of the mole are uneven, blurred or ragged, the C stands for color, shades of brown, black or blue may be present within mole, the D stands for diameter, the mole is bigger than 6 mm, the size of a pencil eraser and E stands for evolution, the mole has changed in shape, size or color. Monthly self- skin exams can lead to early detection of skin cancer, which leads to early treatment, and prevents progression of cancer. According to the American Academy of Dermatology (2021), about half of melanomas are self-detected.

### **Cost of Skin Cancer Treatment**

The incidence and cost of skin cancer is rising. In 2011, 5 million cases of skin cancer were treated, at a cost of \$8.1 billion dollars. As the incidence of skin cancer increases, the average cost of treatment per patient has increased yearly (Chen, Kempton & Rao, 2016). In that most skin cancer cases are preventable; this is an unnecessary cost to both the patient and the health care system. More than 419,000 cases of skin cancer are linked to indoor tanning beds, leading to \$343.1 million dollars being spent on medical care of skin cancer directly due to tanning bed use (“Skin Cancer Facts & Statistics, 2021). Skin cancer can be prevented through annual full body examinations by a dermatologist, which many insurance companies cover, and by applying sunscreen daily. On average, a bottle of sunscreen costs around 25 dollars in comparison to the hundreds if not thousands of dollars it takes to treat a patient with skin cancer. Education in the usage of preventative measures is imperative in mitigating the rising health care costs.

### **III. Goal, PICO Question**

#### **Goal**

The primary goal of this DNP project is to increase sunscreen compliance and overall skin cancer awareness among adolescents and young adults. The average age range of people who get annual full body exams is 40 and above. This is most likely because the effects of the sun damage are finally visible. It is important to educate the younger population on the importance of sunscreen and overall skin cancer because more than half a person's sun accumulation occurs during childhood and adolescence. Normalizing annual full body exams and applying sunscreen daily beginning in childhood is critical to help prevent both the development of skin cancer and premature aging, which is another detrimental side effect of excessive sun exposure.

### **PICO**

Can an educational video increase sunscreen usage and overall awareness of skin cancer and the effects of sun in adolescents and young adults?

P- Adolescents and young adults (13-30)

I – Educational video

C- Can an educational video increase sunscreen compliance compared to verbal instructions about wearing sunscreen?

O- Increase sunscreen usage and sun-protective behaviors and decrease skin cancer rate

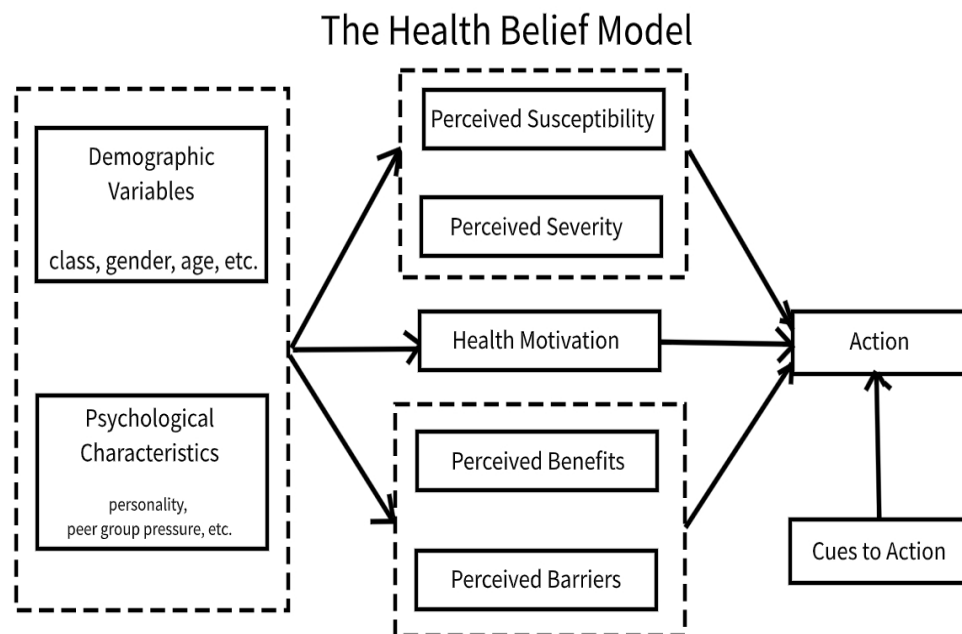
### **IV. Definition of Terms**

**ABCDE:** Pneumonic used for self-skin examinations to identify new or changing moles. Letters stand for: (A) asymmetry, (B) border, (C) color (dark black, or multiple colors), (D) diameter (greater than 6 mm, size of a pencil eraser), (E) evolving (looks different from the rest, changing color or size)

### **V. Theoretical Framework**

The middle-range theory utilized in this DNP project is The Health Belief Model (HBM). The HBM model was developed in the early 1950s in order to understand the failure of people to adopt disease prevention strategies and screening tests for early detection of a disease (LaMorte, 2019). It was discovered that an individual's course of action depended on the persons perception of their susceptibility to the condition and their perception of the benefits related to the health behavior. The Health Belief Model (HBM) suggests that the recommendations will achieve optimal behavior change if they successfully affect the patient's perceived barriers, benefits, self-efficacy and threat (Jones et al., 2015). The HBM consists of 6 of the following elements,

1. Perceived Susceptibility
2. Perceived Severity
3. Perceived Benefits
4. Perceived Barriers
5. Cue to action
6. Self-Efficacy



By utilizing this middle-range theory, the DNP project will focus on the six main elements of the model. This will help ensure that the intervention is focused on helping the individual believe that the health behaviors discussed will indeed benefit them. The intervention will not only emphasize the benefit of wearing sunscreen daily, but will also concentrate on increasing a patient's faith in their ability to perform the task daily. The intervention will also showcase the statistics of skin cancer which will increase the patients perceived susceptibility of getting skin cancer; therefore, it will lead to both increased sunscreen usage and preventative methods such as self-skin exams and full body exams.

## VI. Methodology

### Introduction of QI Methodology (PDSA)

The Plan, Do, Study, Act (PDSA) cycle is a four-phase problem-solving model that is widely used in quality improvement projects (Knudsen, 2019). This cycle provides a structure



for developing, testing and implementing change leading to improvement. The PDSA cycle is used with consecutive iterations of the cycle to guarantee the intervention will improve the problem (Knudsen, 2019). In this DNP project, the “Plan” phase consists of creating the study design, setting, sample population, intervention method and data collection. It also includes obtaining IRB approval. The “Do” phase is the completion of the intervention at the site. The “Study” phase consists of analyzing the data collected from the pre- and post-test surveys in the “Do” phase. The “Act” phase involves presenting the data collected and implementing the intervention at the site.

### **Study Design**

The study design for this QI project will be structured as a pre-test, intervention and a post-test. This design is arranged to collect data from various points throughout the study, specifically before and after the intervention, in order to conduct an analysis of the intervention’s success. An online pre-test will be conducted to test the participants’ level of knowledge about skin cancer, the negative effects of the sun and their behavior on sun protective actions. Next, the educational video intervention on skin cancer intervention will be viewed, which will be followed by a post-test survey to test changes in the participants knowledge of skin cancer, negative effects of the sun, and their resulting potential changed behaviors involving sun protective actions.

### **Setting**

The QI project was conducted at a privately owned dermatology office. The project is specifically focused on patients of the facility.

### **Sample**

The QI sample population consisted of 20 participants within the ages of 13-30. All 20 participants completed the pre-intervention survey (n=20) and the post-intervention survey (n=20). The patient inclusion criteria include the targeted age range, 13-30, and patients coming to the office for visits unrelated to full body exams and mole checks. Thus, the exclusion criteria include patients older than 30 and patients with scheduled full body exams or mole checks.

### **Intervention**

The intervention will consist of an 8-minute evidence-based educational video. The educational video will be displayed on a sanitized laptop. The video will include information about sunscreen, including why sunscreen is important, specifically during adolescents and young adulthood, the advantages of applying sunscreen daily, the type of sunscreen recommended and how often sunscreen reapplication should occur. The video will also discuss and show pictures of the different types of skin cancer, how to conduct self-skin exams using the ABCDE method, and the advantages of yearly full body exams.

### **Data Collection**

The pre- and post- test survey will be created on Qualtrics, an online web-based survey system. The surveys are accessed by the participants via an anonymous link. The same anonymous link is provided to all participants. The subject's identity is anonymous, no identifiable information will be collected. Demographic data such as gender, age, ethnicity and race will be collected. At the end of the pre-test, the participant will be given a random numerical identification code, which they will import into the post- test, in order to be able to compare the subject's pre-test and post-test scores. The pre-test will be given prior to the educational video. The pre-test will include 17 questions testing the participants knowledge of skin cancer, types of

skin cancer, the meaning of ABCDE acronym, sunscreen reapplication time; and behavioral based questions such as tanning bed use, sunscreen use, whether they perform monthly skin checks and if they have gotten a full body exam by a dermatologist. The post-test surveys will be accessed through an anonymous link provided to the patient after the educational video. The post-test survey questions will be the same questions asked from the pre-test survey.

### **Data Analysis**

The survey data from Qualtrics was analyzed on Qualtrics by utilizing its data analysis and Qualtrics crosstab function, allowing the DNP candidate to determine the gender-based differences. The pre-test and post-test scores were analyzed and compared to determine the effectiveness of the intervention.

### **Protection of Human Subjects**

Potential participants were given an informational letter describing their anticipated level of involvement in the project. Patients who elected to participate in the study were given a consent form which includes a summary and the purpose of study, the duration, risks/benefits, confidentiality, compensation and their right to withdraw. Patients 18 and older provided verbal consent, and for patients under age 18, their legal guardian signed a written consent form. During intervention all consent forms and data were stored in the DNP candidate's password protected computer. Following termination of intervention and completion of data analysis, all consent forms and data were destroyed.

### **Management/Timeline**

Before the project could start the DNP candidate and lead faculty submitted an application to Florida International University Institutional Review Board (IRB). The DNP candidate created and submitted a mitigation plan outlining the reasons in-person human subject

research was necessary and the precautions that would be utilized to prevent COVID to the Florida International University Office of Research and Economic Development (ORED). Once approval was received from both IRB and ORED, the project was implemented. The project was completed over a 3-week period.

### **Benefits**

The anticipated benefits for the QI project participants are an increased knowledge and awareness of skin cancer and the negative effects of the sun, improved compliance of sunscreen usage and skin cancer preventative and detection methods. The benefits of the QI project will not only affect the participants, but will affect society because by reaching more individuals and improving their knowledge, the goal is to decrease the rate of skin cancer.

### **Risks**

The risk of the QI project for the participants was minimal to non-existent. The QI project included a pre-intervention survey, educational video and post-intervention survey. Involvement in the QI project was voluntary, and no consequences occurred if they did not choose to participate in the project. There was no compensation for the participants for partaking in the QI project.

## **VII. Results**

The purpose of the QI project was to increase knowledge and awareness of adolescents and young adults regarding skin cancer and the negative effects of the sun. By increasing their knowledge and awareness, it would lead to the second intended goal of the QI project, which is to improve sunscreen compliance and other skin cancer preventative measures.

### **Demographics**

#### ***Survey Sample***

Of the 20 participants in the QI project, 13 identified as female and 7 identified as male. All 20 participants were within the targeted age range of 13-30. The 20 participants' age ranges were categorized into 6 groupings: 13-15 years (n=2), 16-18 years (n=5), 19-21 years (n=3), 22-24 years (n=3), 25-27 years (n=3), and 28-30 years (n=4). 11 of the participants identified themselves as Caucasian, and 9 identified themselves as African American. Regarding ethnicity, 17 identified themselves as not Latino or Hispanic, and 3 identified themselves as Latino or Hispanic.

### Demographics of QI Project Participants

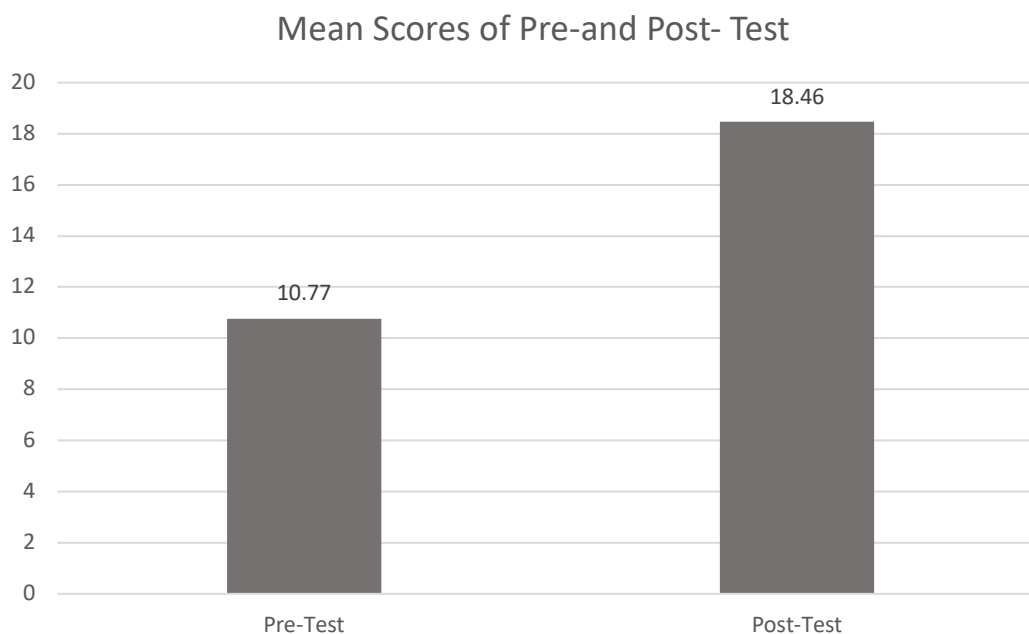
<b><u>Count</u></b>	
<b><u>Gender</u></b>	
<b><i>Male</i></b>	<b>7</b>
<b><i>Female</i></b>	<b>13</b>
<b><u>Age</u></b>	
<b><i>13-15</i></b>	<b>2</b>
<b><i>16-18</i></b>	<b>5</b>
<b><i>19-21</i></b>	<b>3</b>
<b><i>22-24</i></b>	<b>3</b>
<b><i>25-27</i></b>	<b>3</b>
<b><i>28-30</i></b>	<b>4</b>
<b><u>Race</u></b>	
<b><i>African American</i></b>	<b>9</b>
<b><i>Caucasian</i></b>	<b>11</b>
<b><i>American Indian</i></b>	<b>0</b>
<b><i>Asian</i></b>	<b>0</b>
<b><i>Native Hawaiian</i></b>	<b>0</b>
<b><u>Ethnicity</u></b>	
<b><i>Hispanic or Latino</i></b>	<b>3</b>
<b><i>Not Hispanic or Latino</i></b>	<b>17</b>

***Pre-and Post-Test Results of Knowledge of Skin Cancer***

A two-tailed paired sample *t*-test was performed to analyze the data from the pre-test and post-test surveys. The result of the two-tailed paired samples test was statistically significant based on an alpha value of 0.05,  $p = <.001$ . This finding implies the difference in the mean of the pre-test and the mean of the post-test was significantly different from zero. The mean in the post-test was appreciably higher than the mean in the pre-test.

***Two-Tailed Paired Samples *t*-Test Results***

	Pre-Test	Post-Test	P-Value- <0.001
Mean	10.77	18.46	
SD	5.66	2.54	

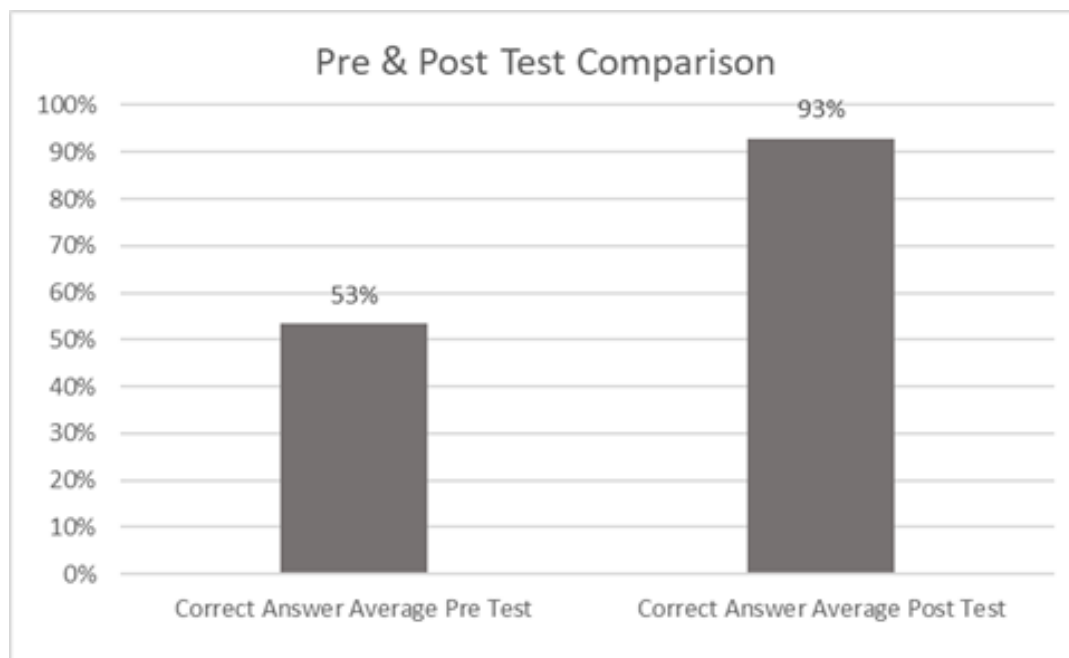


***Pre- and Post- Test Scores***

Regarding the participants level of knowledge about skin cancer and sun protective behaviors, results revealed 53% pre-test averages compared to 93% post-test average, thus indicating a 40% change in a positive direction. During the pre-test, 9 out of the 20 participants (45%), 4 males and 5 females, were unaware that skin cancer is the most common cancer in the United States while in the post-test, all participants answered the question correctly. The lack of awareness of the 3 most common types of skin cancer was evident in the pre-test when only 8 of the 20 participants (40%) answered correctly. The gender-based difference was apparent, as 7 of the 8 correct responses came from female participants. The post-test revealed an increase in knowledge of the types of skin cancer, as 17 participants answered correctly. This question had a percentage increase from 40.0% to 85.0%. During the pre-test, 7 participants (35%) believed indoor tanning beds were safer than outdoor tanning. Among these 7 participants, 4 were male and 3 were female. In the post test, all participants answered the question correctly. This question had a percentage increase of 65%. In the pre-test, 7 out of 20 participants (35%) had knowledge of the meaning of the ABCDE acronym. Of the 7 participants with the correct responses, 5 were female and 2 were male. The post-test revealed a percentage increase of 55%, indicating 18 out of 20 participants (90%) answered correctly.

With regard to indoor tanning, in the pre-test 20% indicated that they currently use or have a history of indoor tanning bed use. In the post-test 100% of participants indicated they will no longer use an indoor tanning bed. In the pre-test, 10% of participants revealed that they perform monthly self-skin checks, in comparison, in the post-test, 55% of participants revealed they will now perform monthly self-skin checks. In the pre-test, 9 participants (45%) disclosed they have received a full body exam by a dermatologist. Of the 9 participants, 8 of them identified as female.

The post-test revealed a percentage increase of 50%, indicating a potential behavioral change. During the pre-test, 11 participants (55%) indicated that they applied sunscreen daily. Among those participants, 3 identified as male and 8 identified as female. The post-test indicated complete behavioral modification, as 100% of participants revealed they will apply sunscreen daily.



### VIII. Discussion

The results of the pre-and post- intervention surveys exhibit significant improvement in adolescent and young adults' knowledge and awareness of skin cancer, the importance of self-examinations and body checks and changes in sun protective behaviors. The project found that after watching an educational video showcasing the negative effects of the sun, types of skin cancer, how to perform monthly skin exams and the benefits of sunscreen and other sun protective behaviors, participants knowledge not only increased, but also their confidence in their ability to perform self-skin exams and identify abnormal moles. By equipping participants with



the proper educational tools, healthcare professionals can guide patients' preventative practices, self-efficacy detection, and overall knowledge related to skin cancer.

This project confirmed the findings from the study conducted by Tuong & Armstrong (2014) that appearance-based education shows promise in promoting sunscreen use in adolescents and young adults. Research has shown that adolescents and young adults have a difficult time practicing preventive health behaviors as they do not believe they are susceptible to the disease or condition. This project applied the appearance-based intervention in an educational video intervention. The educational video illustrated the long-term effects of unprotected UV exposure and how it contributes to premature aging of the skin, such as wrinkles, hyperpigmentation, uneven texture, and redness and blotchiness of the skin. The sun-protective behaviors of adolescents and young adults changed significantly in the pre-test survey and the post-test survey. For instance, when asked about indoor tanning bed use, 20% of participants indicated they currently use or have used a tanning bed and, after the interventional video, 100% of the participants revealed they will not use or no longer indoor tanning beds. The most significant behavioral change involved the use of daily sunscreen. The pre-test revealed 55% of participants applied sunscreen daily, compared to 100% in the post-test. By showcasing the detrimental effects of what happens to unprotected skin from continuous ultraviolet exposure, adolescents and young adults are more likely to perform preventive sun protective behaviors to combat the likelihood that it can affect them.

### **IX. Limitations**

The QI project had several limitations, including a small sample size and time constraints. The sample size was small due to the number of patients within the targeted age range that presented to the dermatology office. Since most patients that came to the dermatology

practice were 30 and older, the potential participants were limited. Another limitation this project faced was time, for multiple reasons. First, approval from FIU IRB took longer than anticipated, leading to a delayed implementation start. Second, the participants were patients who were scheduled for 15-minute visits and did not have time to stay to participate and complete the QI project, as many had other commitments to attend. The lack of time that participants had available also contributed to the small sample size.

### **X. Implications for Advanced Nursing Practice**

To effectively decrease the incidence of skin cancer, education about skin cancer, the effects of the sun and the benefits of sun protective behaviors needs to be done in adolescence. By having healthcare professionals educate adolescents and young adults during routine healthcare visits, it will increase awareness and knowledge of skin cancer and the damaging effects of the sun's UV rays leading to improved compliance of practicing preventive sun protective behaviors. Many adolescents and young adults may be aware of skin cancer but, do not believe they can be impacted by it, which is why reinforcing education about skin cancer, protection and preventive measures in routine health care visits will aid in increasing awareness and compliance in this age group. The UPSTF (2018) recommends counseling adolescents and young adults about minimizing exposure to ultraviolet radiation to reduce their risk of skin cancer. It is the responsibility of health care professionals to educate young patients about the unseen inherent dangers of the sun's UV rays and skin cancer preventive measures during office visits.

### **XI. Conclusion**

The importance of this project is profound, as skin cancer is the most common cancer in the United States with incidence rising annually. Prevention of skin cancer is a priority especially

in adolescents and young adults as skin cancer can be prevented or cases significantly reduced with compliance and adherence to responsible sun protection. Health care professionals can impact adolescents and young adults during office visits by educating and encouraging them to perform simple actions to protect themselves from the negative effects of suns UV rays by wearing broad spectrum sunscreen with an SPF of at least 15, wearing sun protective clothing such as long-sleeves, long pants, hats and sunglasses and by avoiding direct sunlight during peak hours. Through direct education and counseling about sun protection, it will reduce intermediate outcomes such as sunburns, indoor tanning use, and outdoor tanning or activities without sun protection. By increasing the younger populations awareness of the damaging and compounding effects of unprotected ultraviolet exposure at a young age, we can improve their compliance of sun protective behaviors which will correlate with a decrease in the incidence of skin cancer and help create a healthier lifestyle for them.

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### XIII. Appendices

#### IRB Approval Letter



Office of Research Integrity  
Research Compliance, MARC 414

#### MEMORANDUM

**To:** Dr. Dana Sherman  
**CC:** Chelsey Bennis  
**From:** Maria Melendez-Vargas, MIBA, IRB Coordinator   
**Date:** September 29, 2021  
**Protocol Title:** "Improving sunscreen compliance and awareness of skin cancer and the effects of the sun in adolescence and young adults: A quality improvement project."

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The Social and Behavioral Institutional Review Board of Florida International University has approved your study for the use of human subjects via the **Expedited Review** process. Your study was found to be in compliance with this institution's Federal Wide Assurance (00000060).

**IRB Protocol Approval #:** IRB-21-0420      **IRB Approval Date:** 09/28/21  
**TOPAZ Reference #:** 110708      **IRB Expiration Date:** 09/28/24

As a requirement of IRB Approval you are required to:

- 1) Submit an IRB Amendment Form for all proposed additions or changes in the procedures involving human subjects. All additions and changes must be reviewed and approved by the IRB prior to implementation.
- 2) Promptly submit an IRB Event Report Form for every serious or unusual or unanticipated adverse event, problems with the rights or welfare of the human subjects, and/or deviations from the approved protocol.
- 3) Utilize copies of the date stamped consent document(s) for obtaining consent from subjects (unless waived by the IRB). Signed consent documents must be retained for at least three years after the completion of the study.
- 4) **Receive annual review and re-approval of your study prior to your IRB expiration date.** Submit the IRB Renewal Form at least 30 days in advance of the study's expiration date.
- 5) Submit an IRB Project Completion Report Form when the study is finished or discontinued.

**HIPAA Privacy Rule:** N/A

**Special Conditions:** N/A

For further information, you may visit the IRB website at <http://research.fiu.edu/irb>.

MMV/em



**Pre-Test/Post-Test Survey Questions**

1. What is your gender?
  - a. Male
  - b. Female
2. How old are you?
  - a. 13-15
  - b. 16-18
  - c. 19-21
  - d. 22-24
  - e. 25-27
  - f. 28-30
3. Which best describes your race?
  - a. AA
  - b. White
  - c. American Indian
  - d. Asian
  - e. Native Hawaiian/ Pacific Islander
4. Which best describes your ethnicity?
  - a. Hispanic or Latino
5. Sunburns can be related to the development of skin cancer.
  - a. True
  - b. False
6. Increased unprotected sun exposure has an impact on premature aging.
  - a. True
  - b. False
7. The 3 main types of skin cancer include.
  - a. Basal cell carcinoma, sun cell carcinoma, melanoma
  - b. Blue cell carcinoma, squamous cell carcinoma, molluscum
  - c. Basal cell carcinoma, Squamous cell carcinoma, melanoma
8. Have or do you tan in an indoor tanning bed? After this video, will you continue using an indoor tanning bed?
  - a. Yes
  - b. No
9. Are indoor tanning beds safer than outdoor tanning?
  - a. Yes
  - b. No
10. ABCDE acronym stands for?
  - a. (A) asymmetry, (B), border, (C) color, (D) diameter, (E) evolution
  - b. (A) aging (B) border, (C) change (D) diameter (E) evolution
  - c. (A) asymmetry, (B) black (C) color, (D) diameter, (E) evolution
11. How often do you check your skin/will check their skin?
  - a. Monthly
  - b. Daily
  - c. Weekly

12. How often is it recommended to get a skin exam by a dermatologist with no hx of skin cancer?
  - a. Yearly
  - b. Every 2 years
  - c. After the age of 30
13. Have you ever had your moles checked by a dermatologist? /After this video, will you schedule to get them checked?
  - a. Yes
  - b. No
14. Do you wear sunscreen daily? / After this video, will you wear sunscreen daily?
  - a. Yes
  - b. No
15. The recommended SPF is 30 or higher.
  - a. True
  - b. False
16. When in the sun, how often are you supposed to reapply sunscreen?
  - a. 1 hour
  - b. 2 hours
  - c. 3 hours

## Support Letter

Date: 7/7/2020

Dana Sherman, DNP, APRN, ANP-BC, FNP-BC

Clinical Assistant Professor

Nicole Wertheim College of Nursing & Health Sciences

Florida International University

Dear Dr. Sherman,

Thank you for inviting Clearlyderm Dermatology to participate in the DNP Project of Chelsey Bennis. I understand that this student will be conducting this project as part of the requirements of the Doctor in Nursing Practice program at Florida International University. After reviewing the proposal of the project titled *"Improving sunscreen compliance and awareness of skin cancer and the effects of the sun in adolescents and young adults: A quality improvement project."* I have warranted her permission to conduct the project in this company.

We understand that the project will develop in our setting and will occur over a week time frame. We are also aware of our staff participation in supporting the student to complete this project, including warrant the student access to our facility, give consent, deliver the pre-test questionnaire, provide the educational intervention and deliver the post-test questionnaire. We will provide a peaceful environment to safeguard our participants privacy as well as an adequate area to conduct the educational activity.

This project intends to evaluate if an educational video will increase adolescents and young adults' overall knowledge of skin cancer and prevention techniques as well as improve sunscreen compliance. Prior to the implementation of the project, the Florida International University Institutional Review Board will evaluate and approve the procedures to conduct this project.

The educational intervention will be provided in a video format, with the pre and posttest performed on Qualtrics, an online survey system. The video will last 8 minutes, and all materials will be given to each participant. Any data collected by Chelsey bennis will be kept confidential and stored on a password protected computer.

We expect that Chelsey Bennis will not interfere with the normal office performance, behave in a professional manner and follow office standards of care.



Dan Ilkuvitch, MD, PhD, FAAD

## Parental Consent

FIU IRB Approval:	09/28/2021
FIU IRB Expiration:	09/28/2024
FIU IRB Number:	IRB-21-0420



### PARENTAL CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Improve Sunscreen Compliance and Increase Awareness of Skin Cancer and the Effects of the Sun in Adolescents and Young Adults

#### SUMMARY INFORMATION

Things you should know about this study:

- **Purpose:** The purpose of the study is to improve sunscreen compliance, knowledge and awareness of skin cancer and the effects of the sun in adolescents and young adults.
- **Procedures:** If you choose to allow your child to participate, your child will be asked to take a pre-test, watch an educational video and take a post-test.
- **Duration:** This will take about 15-20 minutes.
- **Risks:** The main risk or discomfort from this research is the time frame.
- **Benefits:** The main benefit to your child from this research is to increase knowledge about the effects of the sun, increasing sunscreen usage which will minimize the risk of developing skin cancer in the future.
- **Alternatives:** There are no known alternatives available to your child other than not taking part in this study.
- **Participation:** Taking part in this research project is voluntary.

Please carefully read the entire document before agreeing to participate.

#### PURPOSE OF THE STUDY

The purpose of this study is to improve sunscreen compliance, knowledge and awareness of skin cancer and the effects of the sun in adolescents and young adults.

#### NUMBER OF STUDY PARTICIPANTS

If you agree to allow your child to participate in this study, he/she will be one of 15 people in this research study.

#### DURATION OF THE STUDY

Your child's participation will involve 15-20 minutes.

#### PROCEDURES

If your child participates in this study, we will ask your child to do the following things:

<b>FIU IRB Approval:</b>	09/28/2021
<b>FIU IRB Expiration:</b>	09/28/2024
<b>FIU IRB Number:</b>	IRB-21-0420

1. To participate in a pre-test survey. After the pre-test, participants will be asked to watch an 8-minute educational video. Once the video is complete, the participants will be asked to take a post-test survey.
2. The survey will be anonymous and will not include any definitive identifiers, only gender and age will be collected during the survey.

#### **RISKS AND/OR DISCOMFORTS**

The study has the following possible risks to your child: No risks are expected during this project.

#### **BENEFITS**

The study has the following possible benefits to your child: This study will benefit your child by increasing their knowledge and awareness of skin cancer and the effects of the sun. By increasing their knowledge and awareness it will also improve their sunscreen usage to minimize their risk of developing skin cancer in the future.

#### **ALTERNATIVES**

There are no known alternatives available to your child other than not taking part in this study

#### **CONFIDENTIALITY**

The records of this study will be kept private and will be protected to the fullest extent provided by law. In any sort of report we might publish, we will not include any information that will make it possible to identify your child. Research records will be stored securely and only the researcher team will have access to the records. However, your child's records may be inspected by authorized University or other agents who will also keep the information confidential.

#### **COMPENSATION & COSTS**

There are no costs to your child for participating in this study.

#### **RIGHT TO DECLINE OR WITHDRAW**

Your child's participation in this study is voluntary. Your child is free to participate in the study or withdraw his/her consent at any time during the study. Your child will not lose any benefits if he/she decides not to participate or if your child quits the study early. The investigator reserves the right to remove your child from the study without your consent at such time that he/she feels it is in the best interest.

<b>FIU IRB Approval:</b>	09/28/2021
<b>FIU IRB Expiration:</b>	09/28/2024
<b>FIU IRB Number:</b>	IRB-21-0420

**RESEARCHER CONTACT INFORMATION**

If you have any questions about the purpose, procedures, or any other issues relating to this research study you may contact Dr. Dana Sherman at FIU, (305)-348-4227, [dsherman@fiu.edu](mailto:dsherman@fiu.edu) or Chelsey Bennis, (954)-849-3345, [cbenn041@fiu.edu](mailto:cbenn041@fiu.edu)

**IRB CONTACT INFORMATION**

If you would like to talk with someone about your child's rights of being a subject in this research study or about ethical issues with this research study, you may contact the FIU Office of Research Integrity by phone at 305-348-2494 or by email at [ori@fiu.edu](mailto:ori@fiu.edu).

**PARTICIPANT AGREEMENT**

I have read the information in this consent form and agree to allow my child to participate in this study. I have had a chance to ask any questions I have about this study, and they have been answered for me. I understand that I will be given a copy of this form for my records.

\_\_\_\_\_  
Signature of Parent/Guardian

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed Name of Parent/ Guardian

\_\_\_\_\_  
Printed Name of Child Participant

\_\_\_\_\_  
Signature of Person Obtaining Consent

\_\_\_\_\_  
Date

## Adult Verbal Consent

FIU IRB Approval:	09/28/2021
FIU IRB Expiration:	09/28/2024
FIU IRB Number:	IRB-21-0420



### ADULT VERBAL CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Improve Sunscreen Compliance and Increase Awareness of Skin Cancer and the Effects of the Sun in Adolescents and Young Adults

#### SUMMARY INFORMATION

Things you should know about this study:

- **Purpose:** The purpose of the study is to improve sunscreen compliance, knowledge and awareness of skin cancer and the effects of the sun in adolescents and young adults.
- **Procedures:** If you choose to participate, you will be asked to participate in taking a pre-test and post-test survey and watch an educational video
- **Duration:** This will take about 15-20 minutes
- **Risks:** The main risk or discomfort from this research is the time frame.
- **Benefits:** The main benefit to you from this research is to increase knowledge about the effects of the sun, increasing sunscreen usage which will minimize the risk of developing skin cancer in the future.
- **Alternatives:** There are no known alternatives available to you other than not taking part in this study.
- **Participation:** Taking part in this research project is voluntary.

Please carefully read the entire document before agreeing to participate.

#### PURPOSE OF THE STUDY

The purpose of this study is to improve sunscreen compliance, knowledge and awareness of skin cancer and the effects of the sun in adolescents and young adults.

#### NUMBER OF STUDY PARTICIPANTS

If you decide to be in this study, you will be one of 15 people in this research study.

#### DURATION OF THE STUDY

Your participation will involve 15-20 minutes.

#### PROCEDURES

If you agree to be in the study, we will ask you to do the following things:

<b>FIU IRB Approval:</b>	09/28/2021
<b>FIU IRB Expiration:</b>	09/28/2024
<b>FIU IRB Number:</b>	IRB-21-0420

1. To participate in a pre-test survey. After the pre-test, participants will be asked to watch an 8-minute educational video. Once the video is complete, the participants will be asked to take a post-test survey.
2. The survey will be anonymous and will not include any definitive identifiers, only gender and age will be collected during the survey.

#### **RISKS AND/OR DISCOMFORTS**

The study has the following possible risks to you: No risks are expected during this project.

#### **BENEFITS**

The study has the following possible benefits to you: This study will benefit your child by increasing their knowledge and awareness of skin cancer and the effects of the sun. By increasing their knowledge and awareness it will also improve their sunscreen usage to minimize their risk of developing skin cancer in the future.

#### **ALTERNATIVES**

There are no known alternatives available to you other than not taking part in this study

#### **CONFIDENTIALITY**

The records of this study will be kept private and will be protected to the fullest extent provided by law. In any sort of report, we might publish, we will not include any information that will make it possible to identify you. Research records will be stored securely, and only the researcher team will have access to the records. However, your records may be inspected by authorized University or other agents who will also keep the information confidential.

#### **COMPENSATION & COSTS**

There are no costs to you for participating in this study.

#### **RIGHT TO DECLINE OR WITHDRAW**

Your participation in this study is voluntary. You are free to participate in the study or withdraw your consent at any time during the study. You will not lose any benefits if you decide not to participate or if you quit the study early. The investigator reserves the right to remove you without your consent at such time that he/she feels it is in the best interest.



<b>FIU IRB Approval:</b>	09/28/2021
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**RESEARCHER CONTACT INFORMATION**

If you have any questions about the purpose, procedures, or any other issues relating to this research study you may contact Dr. Dana Sherman at FIU, (305)-348-4227, [dsherman@fiu.edu](mailto:dsherman@fiu.edu) or Chelsey Bennis, (954)-849-3345, [cbenn041@fiu.edu](mailto:cbenn041@fiu.edu)

**IRB CONTACT INFORMATION**

If you would like to talk with someone about your rights of being a subject in this research study or about ethical issues with this research study, you may contact the FIU Office of Research Integrity by phone at 305-348-2494 or by email at [ori@fiu.edu](mailto:ori@fiu.edu).

Do you provide your consent to participate in this research project?