

Caregivers' Response to Pediatric Clinicians Sun Protection Anticipatory Guidance: Sun Protective Swim Shirts for 2-6 year old Children

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Abstract

Background: Sun exposure, particularly during childhood, is an important contributing factor in the risk of developing skin cancer later in life. Relying on sunscreen as the sole method of sun protection is problematic and may provide insufficient sun protection for the user due to failure to protect some areas of the body, and wearing off with physical activities like swimming. The response of caregivers of children aged 2-6 years old to anticipatory guidance by pediatricians and pediatric nurse practitioners regarding sun protection, especially using sun protective swim shirts (swim shirts), was evaluated.

Study design: A convenience sample of caregivers completed a self-report questionnaire at three offices of a suburban pediatric practice from June to August 2014. Clinicians counseled caregivers on sun protection practices and provided caregivers an anticipatory guidance tip sheet with a voucher to obtain online a free swim shirt for their child. Voucher redemption and having a swim shirt were assessed.

Results: Pediatric clinicians delivered the sun protection recommendations during well-child visits in less than 2 minutes. Caregivers completed 824 questionnaires across the three clinical sites. Caregivers were more likely to redeem a swim shirt for a male child between the ages of 2 and 6 years old ($P = .045$). Female caregivers, who completed college or had a graduate degree, were more likely to obtain the swim shirt ($P = .010$). Additionally, caregivers were prompted by sunny weather to redeem a swim shirt for their child. Hispanic caregivers were less likely to redeem a voucher than others ($P < .05$).

Conclusions: Swim shirt redemption by caregivers of children aged 2 to 6 years was related to sunny weather, and the gender of the child.

Keywords: Sun protection; Swim shirt; Anticipatory guidance; Melanoma

Abbreviations: SPF: Sun Protection Factor; Swim Shirt: Sun Protective Swim Shirts; UVI: Ultraviolet Light Index; US: United States

Introduction

Melanoma is the third most common form of cancer in adolescents and young adults in the United States (US) [1]. Sun exposure, particularly during childhood, is an important contributing factor in the risk of developing skin cancer later in life [2,3]. In order to address the rising incidence of melanoma, the US Surgeon General issued a call to action to address skin cancer prevention [4].

Pediatric clinicians recognize the importance of reducing sun exposure in young children and are able to counsel parents and patients effectively with recommended sun protective measures such as the use of sunscreen [5]. Regular application of sunscreen can dramatically reduce the risk of developing melanoma and squamous cell carcinoma [6,7], potentially lethal forms of skin cancer. Relying on sunscreen as the sole method of sun protection is problematic and may provide insufficient sun protection for the user due to failure to protect some areas of the body [8] and wearing off with physical activities like swimming [9]. Additional barriers to sunscreen use include cost [10] and messy application [11]. Sun protective clothing can be used in addition to or instead of sunscreens to provide adequate sun protection.

Sun protective clothing as a helpful form of sun protection for young children could be adopted by caregivers as a cost-effective and reliable method that could help reduce the incidence of skin cancer in the future. Although pediatric clinicians have usually promoted the use of sunscreen, additional measures like sun protective clothing should be presented to young patients and parents more regularly during sun protection counseling [2,5]. While long sleeve sun protective clothing

has a reputation of making its wearers feel hot or being considered as unfashionable, current fabrics and styles have overcome these barriers [2]. Sun protective swim shirts (swim shirts) for young children provide the wearer with consistent sun protection even when wet and obviate the need for repeated application of sunscreens to areas protected by the shirt [12]. The use of swim shirts in addition to sunscreen has yielded some promising results, including a reduction in the incidence of moles on the posterior trunk in young Australian children [13,14].

The goal of this study is to ascertain caregivers' response to anticipatory guidance by pediatric clinicians that included recommending sun protective clothing. Additionally, this research sought to identify characteristics of the caregiver or young child related to the decision to obtain a swim shirt.

Methods

Recruitment of population

A convenience sample of eligible caregivers was obtained from

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Received October 09, 2014; **Accepted** November 14, 2014; **Published** November 16, 2014

Citation: Bhave N, Reidy K, Randall Kinsella T, Brodsky AL, Robinson JK (2014) Caregivers' Response to Pediatric Clinicians Sun Protection Anticipatory Guidance: Sun Protective Swim Shirts for 2-6 year old Children. J Community Med Health Educ 4: 316. doi:[10.4172/2161-0711.1000316](http://dx.doi.org/10.4172/2161-0711.1000316)

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three offices of Lake Forest Pediatrics Associates (Vernon Hills, IL; Lindenhurst, IL; Lake Bluff, IL). At each of the three clinical sites, signage containing information about the study and a sample swim shirt were displayed in the waiting room or nurses' station that were accessible to the caregivers. Information about the sun protection program was placed on the website of the practice and posts were made on Facebook.

Caregivers, who had a child between the ages of 2 and 6 years old, were eligible to participate in this study. Exclusion criteria were caregivers of a sick child between the ages of 2 and 6, and caregivers of children less than 2 years old or greater than 6 years old. Caregivers completed a self-report questionnaire for each of their children who were between the ages of 2 and 6 years old. The Northwestern University Institutional Review Board approved the study.

Design

Pediatric nurses and clinicians at Lake Forest Pediatrics Associates invited caregivers attending the well child's appointment to participate in a study investigating sun protection of young children. The nurses presented the research as voluntary and provided an 18-item self-reported written questionnaire to the caregivers. After measuring the vital signs of the child, the nurse suggested that the caregiver complete the questionnaire before the clinician entered the room. The nurses and clinicians explained that at the conclusion of the questionnaire there was a sun safety tip sheet on how to protect children in the sun as well as voucher for a swim shirt with a coupon code to redeem online at sunhero.org. (Table 1, Sun Protection Anticipatory Guidance) The nurse verified that the caregiver had access to the Internet. Participants were informed that their responses to the questionnaire would be kept anonymous and that no additional information would be requested after completing the questionnaire. The caregiver answered the self-report questionnaire in the examining room while waiting to see the pediatrician or after the clinician left the room.

During the well child visit, pediatric clinicians inquired about the child's sun exposure, sun sensitivity, family history of skin cancer, and sun protective behaviors used. The pediatric clinician briefed the caregiver about the study and re-emphasized how sun protective measures in addition to sunscreen, such as sun protective clothing, was important, especially while swimming. At the end of the patient visit, the pediatric clinician or the nurse placed the completed questionnaire in the collection box located at the nurses' station. Completed questionnaires were collected weekly.

Compensation for participation was a voucher to obtain one swim shirt per each eligible child with a \$3 shipping and handling fee. The voucher had a coupon code that the caregiver typed into the web accessible distribution facility, the sunhero.org store. The free of charge

swim shirt is made of 100% Lycra and has a Sun Protection Factor (SPF) textile equivalent of 100 and Ultraviolet Protection Factor of 50+. The swim shirts were supplied and shipped by the Pediatric Sun Protection Foundation. The voucher also contained recommendations for the caregiver about how to protect children from the ultraviolet light while playing outdoors.

Measures

Delivery of intervention

During the first week, pediatric clinicians were unobtrusively audio recorded discussing the study with eligible participants to assure that anticipatory guidance was delivered consistently by including discussion of: a) child's sun exposure, child's sun sensitivity, or familial history of skin cancer; b) sun protective behaviors used by the child, and c) all participants received anticipatory guidance printed on the voucher. The members of the practice group were timed during their delivery of the sun protection recommendation.

Self-report measures

The self-report questionnaire elicited caregivers' demographic information (α .98), perception of sun sensitivity of their skin (α .89), personal history of skin cancer (α .92), perception of personal risk of developing skin cancer (α .87), and confidence in knowing the best sunscreen to use (α .80). (Table 2, Questionnaire) Regarding the child, the questionnaire elicited demographic information (α .99), caregiver perception of their child's skin sun sensitivity (α .81), child's ability to sunburn or develop skin irritation from the sun (α .93) and suntan or the child's skin becoming darker (α .82).

Swim shirts obtained

Weekly reports of voucher redemption by caregivers were received from the fulfillment service. Additional data that was received in the weekly reports was the time and day at which the caregiver redeemed the swim shirt for their child on the online web accessible distribution facility, sunhero.org.

Ambient sunlight

The Ultraviolet Index (UVI) data for Chicago, IL on the day of the caregiver's redemption of the voucher was obtained from an archived database available on the National Weather Service Climate Prediction Center's web accessible facility. The UVI is based on a scale from 0 to 11, according to increasing levels of exposure to ultraviolet radiation from the sun rated low to extreme.

Statistical Analyses

The data from the questionnaire was organized into categorical,

Sun Safety ABC's
Cumulative sun damage causes skin cancer. The amount of unprotected sun exposure your child has can seriously impact his or her risk of developing skin cancer, especially melanoma. Melanoma is now the most common form of cancer among people 25-29 years old and the second most common for people 15-29 years old.
To minimize the harmful effects of sun exposure, sun protection should be a life-long practice for everyone. By following the ABC steps below, you and your family can enjoy time outside.
A for AVOID SUNBURN: Sunburn is painful. <i>Seek shade</i> when possible, and remember that the sun's rays are strongest between 10 AM and 4 PM. <i>Use extra caution near water, snow, and sand</i> , as they reflect the damaging rays of the sun and can increase your chance of sunburn. <i>Get Vitamin D safely</i> through a diet that includes vitamin supplements and foods fortified with Vitamin D. Don't seek the sun.
B for BLOCK the SUN: Generously apply about one ounce, or the size of a golf ball, of sunscreen to cover all exposed skin 15 minutes before going outside. Sunscreen should have a Sun Protection Factor (SPF) of at least 30 and provide broad-spectrum protection from both ultraviolet A (UVA) and ultraviolet B (UVB) rays. Reapply every two hours, even on cloudy days, and after swimming or sweating. Children less than 6 months old should not use sunscreen. Keep them in the shade.
C for COVER-UP: Wear protective clothing, such as a swim shirt when swimming. When possible, wear a long-sleeved shirt, pants, a wide-brimmed hat, and sunglasses. Sun protective clothing when combined with sunscreen is a very effective method of sun safety.

Table 1: Anticipatory guidance tip sheet attached to voucher. Adapted from Balk SJ, Council on Environmental Health, Section on Dermatology. Ultraviolet radiation: A hazard to children and adolescents. *Pediatrics*. 2011 Caregiver: Please provide the following information about yourself.

1.	Your gender	<input type="radio"/> Female	<input type="radio"/> Male					
2.	Your age	_____ years old						
3.	I am the child's	<input type="radio"/> Mother	<input type="radio"/> Father	O Relative: _____	O Other: _____			
4.	What is the highest level of education the Mother has completed?	<input type="radio"/> Primary school (6 th grade)	<input type="radio"/> Middle school (7 th , 8 th or 9 th grade)	<input type="radio"/> Some high school	<input type="radio"/> Some post-high school education	<input type="radio"/> College graduate	<input type="radio"/> Graduate degree	
5.	What is the highest level of education the Father has completed?	<input type="radio"/> Primary school (6 th grade)	<input type="radio"/> Middle school (7 th , 8 th or 9 th grade)	<input type="radio"/> Some high school	<input type="radio"/> Some post-high school education	<input type="radio"/> College graduate	<input type="radio"/> Graduate degree	
6.	What is your current occupational status?	<input type="radio"/> Student	<input type="radio"/> Work part-time	<input type="radio"/> Work full-time	<input type="radio"/> Unemployed	<input type="radio"/> Retired	<input type="radio"/> Disabled	<input type="radio"/> Other: _____
7.	Which of the following categories best describes the annual household income?	<input type="radio"/> \$ 10,000 to \$ 19,999	<input type="radio"/> \$ 20,000 to \$ 34,999	<input type="radio"/> \$ 35,000 to \$ 50,999	<input type="radio"/> \$ 51,000 to \$100,000	<input type="radio"/> Over \$100,000	<input type="radio"/> I do not wish to respond	
8.	Which of the following describes your ethnic / racial background?	<input type="radio"/> White	<input type="radio"/> Black	<input type="radio"/> Asian or Pacific Islander	<input type="radio"/> Aleut, Eskimo, or Native American	<input type="radio"/> Hispanic or Latino	<input type="radio"/> Other: _____	
9.	Have you had a skin cancer in the past?	<input type="radio"/> No	<input type="radio"/> Yes					
10.	I am at risk of developing a skin cancer.	<input type="radio"/> Strongly disagree	<input type="radio"/> Disagree	<input type="radio"/> Undecided	<input type="radio"/> Agree	<input type="radio"/> Strongly Agree		
11.	My skin is sun sensitive.	<input type="radio"/> Strongly disagree	<input type="radio"/> Disagree	<input type="radio"/> Undecided	<input type="radio"/> Agree	<input type="radio"/> Strongly Agree		
12.	How confident are you that you know the best sunscreen for your child to use?	<input type="radio"/> Not at all Confident	<input type="radio"/> Slightly Confident	<input type="radio"/> Somewhat Confident	<input type="radio"/> Very Confident	<input type="radio"/> Extremely Confident		
13.	What is the age of this child?	<input type="radio"/> 2 up to 3 years old	<input type="radio"/> over 3 up to 4 years old	<input type="radio"/> over 4 up to 5 years old	<input type="radio"/> over 5 up to 6 years old			
14.	This child is a:	<input type="radio"/> Boy	<input type="radio"/> Girl					
15.	My child's skin is sensitive to the sun.	<input type="radio"/> Strongly disagree	<input type="radio"/> Disagree	<input type="radio"/> Undecided	<input type="radio"/> Agree	<input type="radio"/> Strongly Agree		
16.	If after several months of not being in the sun, your child stayed outdoors for 1 hour at noon for the first time in the summer without sunscreen, what would happen to your child's skin?	<input type="radio"/> Always sunburn with painful red skin 24 hours after being in the sun	<input type="radio"/> Easily sunburn with red or pink skin 24 hours after being in the sun	<input type="radio"/> Sometimes sunburn or get skin irritation from being in the sun	<input type="radio"/> Rarely sunburn or get skin irritation from being in the sun	<input type="radio"/> Never sunburn or get skin irritation from being in the sun		
17.	Seven days after the first time in the sun in the summer, would your child develop a tan or would you notice the child's skin becoming darker?	<input type="radio"/> Never tan	<input type="radio"/> Minimally tan or the sun-exposed skin becomes minimally darker	<input type="radio"/> Easily tan or the sun-exposed skin easily becomes darker	<input type="radio"/> Always tan or the sun-exposed skin always becomes darker	<input type="radio"/> The skin is dark and does not get darker after being in the sun.		
18.	I intend to redeem the coupon for a swim shirt for my child.	<input type="radio"/> Yes	<input type="radio"/> No, we would not use it.	<input type="radio"/> No, we already use a swim shirt/rash guard.				

Caregiver for child age 2 to 6 years old: For each question listed, please think about the child who is 2 to 6 years old and was cared for today. Please select the one answer that is the best response to the question.

Table 2: Questionnaire instrument.

ordinal or nominal data, and subsequently analyzed using Pearson's χ^2 test. Phi and Cramer's V values were used to test the strength of the association between two variables that were categorized as nominal or one nominal and one ordinal variable respectively.

The study primarily aimed to correlate voucher redemption with familial history of skin cancer, skin sensitivity of the caregiver and child, and the perception of caregiver's risk of developing skin cancer. Secondary outcomes correlated voucher redemption with demographic information of the child consisting of age, gender, and history of sun sensitivity of the child with ease of sunburn, and demographic information of the caregiver consisting of education of the caregivers, gender, and occupational status.

An ANOVA was conducted to examine whether already having a swim shirt or redeeming a voucher for a swim shirt differed according to parental history of skin cancer, parental perception of skin sun sensitivity, and parental perception of the child having sun sensitive skin or ease of sunburn. Correlation coefficients were used to examine the associations among the two swim shirt conditions (having a swim shirt or using a voucher to obtain a swim shirt) and the variables of parental history of skin cancer, and parental perceptions of sun sensitive skin. For all analyses, a cutoff of $P < .05$ was used to determine statistical significance.

Results

Pediatric clinicians

All members of the clinical staff at Lake Forest Pediatrics Associates participated in the study. The three sites were suburban offices with rotation of the staff among these locations. In total, seventeen pediatricians and six pediatric nurse practitioners performed anticipatory guidance. The pediatric clinicians spent 1-2 minutes discussing sun safety.

Questionnaires

From June 2014 through July 2014, 824 questionnaires were completed by eligible participants. A caregiver of a non-age eligible child, who completed the questionnaire and redeemed a voucher, was excluded from the dataset. Four questionnaires were excluded for missing data and 12.3% of questionnaires were not returned. The response rate for the study was 87.7%.

Characteristics of the caregiver

The mean age of the caregivers was 36.0 years old (Table 3). The respondents primarily identified themselves as White, female mothers. Slightly more than half of eligible caregivers felt they were at risk of developing skin cancer (54.9%) and perceived their skin was sun sensitive (60.0%). All caregivers had access to the web.

Caregiver		Caregivers-Did Not Redeem Voucher (N=674)	Caregivers-Redeemed Voucher (N= 150)
		N (%)	N (%)
Gender	Female	592 (88)	131 (87)
	Male	82 (12)	19 (13)
Age, y (Mean Age: 35.97)	16-30	74 (12)	18 (12)
	31-40	490 (72)	114 (76)
	41-50	102 (15)	18 (12)
	>50	8 (1)	0
Relationship to Child	Mother	590 (87)	131 (87)
	Father	79 (12)	19 (13)
	Relative	5 (1)	0
Highest Level of Education-Mother*	Some High School	1 (-)	1 (-)
	High School Graduate	25 (4)	2 (1)
	Some Post-High School Education	85 (13)	13 (9)
	College Graduate or advanced degree	494 (73)	134(90)
Highest Level of Education-Father	Middle School 7 th ,8 th , 9 th grade	2 (1)	0
	Some High School	6 (1)	3 (1)
	High School Graduate	50 (7)	4 (1)
	Some Post-High School Education	120 (18)	24 (17)
	College Graduate	275 (41)	62 (42)
	Graduate Degree	219 (32)	57 (39)
Current Occupational Status	Student	17 (3)	3 (1)
	Work Part-Time	118 (17)	28 (19)
	Work Full-Time	331 (49)	85 (58)
	Unemployed	98 (14)	20 (13)
	Retired	5 (1)	0
	Disabled	1 (-)	0
	Other: Homemaker	93 (14)	14 (9)
Annual Household Income	Other:	11 (2)	0
	\$10,000-\$19,999	5 (1)	7 (4)
	\$20,000-\$34,999	20 (3)	0
	\$35,000-\$50,999	35 (5)	5 (3)
	\$51,000-\$100,000	186 (27)	38 (25)
	Over \$100,000	353 (53)	77 (52)
	Did Not Wish to Respond	75 (11)	23 (16)
Hispanic *	Yes	75 (11)	6 (4)
	No	599 (89)	144 (96)
Race/Ethnicity	White	599 (89)	128 (85)
	Black	21 (3)	3 (2)
	Asian or Pacific Islander	52 (8)	19 (13)
	Aleut, Eskimo, or Native American	0	0
	Mixed Race	2 (1)	0
Skin Cancer History	No	647 (96)	141 (94)
	Yes	27 (4)	9 (6)
Perceived Sun Sensitivity of Skin	No	269 (40)	67 (46)
	Yes	405 (60)	83 (54)
Child		N (%)	N (%)
Age	2-3	214 (32)	51 (34)
	>3-4	116 (17)	29 (19)
	>4-5	137 (20)	32 (21)
	>5-6	207 (31)	38 (25)
Gender*	Male	337 (50)	90 (60)
	Female	337 (50)	60 (40)
Perceived sun sensitivity of child's skin	No	47 (7)	10 (6)
	Yes	627(93)	140 (96)
Skin Sensitivity without Sunscreen	Never sunburns or gets skin irritation	59 (8)	10 (6)
	Sunburns or gets skin irritation	615 (92)	140 (96)

Table 3: Characteristics of the population.

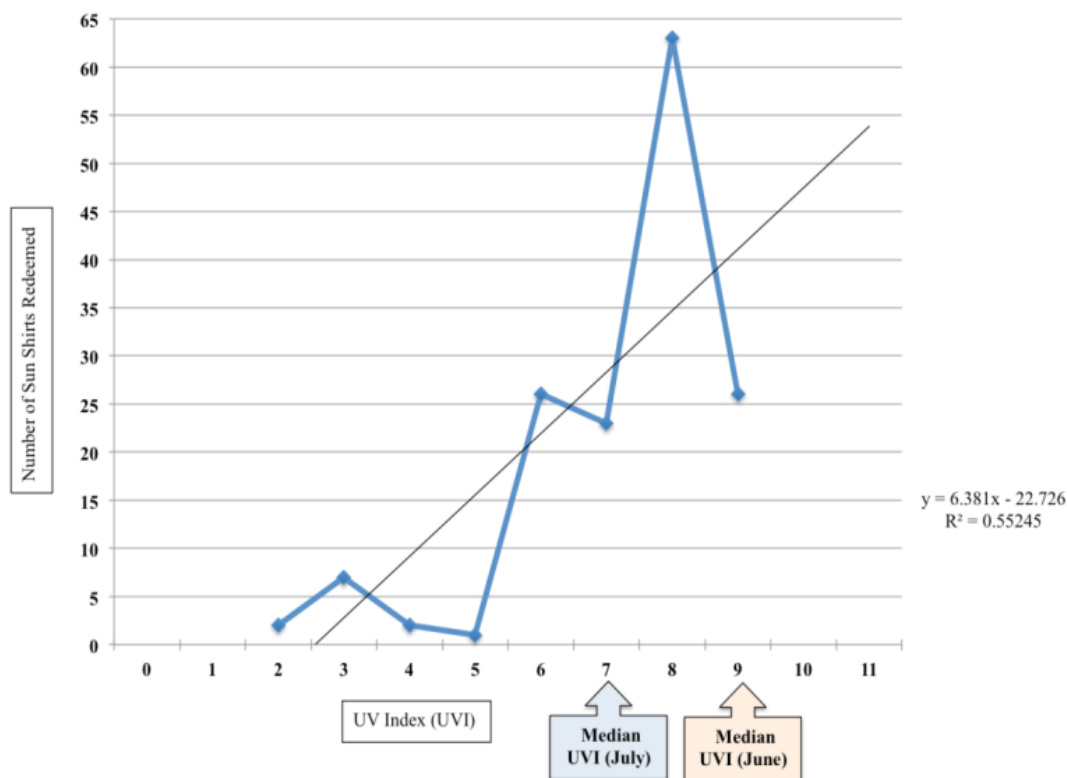


Figure 1: Ultraviolet Index on the day of sun shirt redemption versus the number of sun shirts redeemed.

Characteristics of the child

Most caregivers identified their child as having skin that was sensitive to the sun (93%) and inclined to sunburns or skin irritation from the sun without the application of sunscreen (92%). The caregivers' perception of sun sensitivity of the child was significantly associated with the child getting sunburns or skin irritation from the sun ($P < 0.05$) (Table 3).

Voucher redemption

Eligible subjects redeemed a total of 150 vouchers, which was 18.1% of those completing surveys. The majority of caregivers intended to redeem the swim shirt (84%), but 6% (63/824) already had a swim shirt and 8% (66/824) did not intend to redeem the voucher. Having a child with sun sensitive skin, a parental history of skin cancer, or the caregiver perceiving that they had sun sensitive skin was predictive of either having a swim shirt or redeeming a voucher for a swim shirt (ANOVA, 3 conditions x 1 time, $P < .001$). Caregivers, who did not intend to redeem a swim shirt, were 8% of the respondents and were Hispanic or Black and indicated no perceived sun sensitivity of the child's skin.

The gender of the child, the mother's education with a college or graduate degree, and not being Hispanic were statistically significantly correlated with caregiver voucher redemption for the swim shirt at the 0.05 level. Caregivers were more likely to redeem a swim shirt for their child if the child was male ($P = .045$); however, Cramer's V was found to be 0.070 indicating a weak relationship. Female caregivers with a higher level of education were found to be more likely to redeem a swim shirt for their child ($P = .010$; Cramer's V = 0.126).

Prompting by environment: sunny weather

Caregivers' redemption of a voucher for a swim shirt for their child was correlated positively with the UVI on the day of the swim shirt redemption ($R^2 = 0.552$) (Figure 1). The median daily UVI for Chicago was 8 with a range from 2 to 9. The monthly median UVI for June was 9 and for July, 7 [15].

Discussion

Caregivers were more likely to claim the voucher when the child was a boy, when the mother had a college degree or greater, when the caregiver and child were not Hispanic, and during sunny weather. A unique quality of this study was that the sun protection message was actively delivered by clinicians' recommending the use of swim shirts in combination with sunscreen and other established sun protection methods, providing an anticipatory guidance tip sheet and a voucher to redeem a swim shirt.

A few prior studies have validated the effectiveness of similar strategies for young children. The Kaiser Kids Sun Care Program demonstrated small, yet significant differences in sun protection practices as well as sustained behavioral change in parents of newborns through age 3 [16]. The Sun Sense Study, which implemented the Australian "Slip! Slop! Slap!" message in a multicomponent intervention for parents of children 3-10 years old, found significant improvements in parental sun protection practices and knowledge [17]. Implementing a multicomponent sun protective clothing intervention for young children in the pediatrician office could help to reduce the risk of skin cancer that sunscreen use alone may not be able to achieve.

Pediatric care is oriented towards age-specific anticipatory

guidance, which aims to increase family education and participation in health-promoting and disease prevention activities [18]. Per the 2014 Recommendations for Preventive Pediatric Health Care, anticipatory guidance is to be performed at every well-child visit based on *Bright Futures* guidelines [19]; however, these guidelines are limited to sun avoidance in infancy and use of sunscreen in early childhood and beyond [18]. Sun protection counseling by pediatric clinicians has been thought to be most effective when delivered with seasonal relevance, during the spring and summer months [20]. This study took place during the summer months June 2014 thru July 2014, when recommendations to caregivers and young patients regarding effective sun protection practices were seasonally relevant. The adequate sun protection of children is largely dependent on parental attitudes and behaviors [4], with the strongest predictors being parents' own sun protection habits, perceived barriers, and self-efficacy [21]. Pediatric clinicians are uniquely positioned to effectively engage both caregivers and children, thus, they are essential to improving the primary prevention of skin cancer in children. The current findings of U.S. Preventive Services Task Force indicate that counseling interventions in primary care settings can increase sun-protective behaviors among children, adolescents, and young adults [22]. The recent call to action by US Surgeon General emphasizes the need to improve sun protection to prevent skin cancer [4].

The effectiveness of sun protective swimwear was demonstrated in an Australian study. This study implemented a school-based intervention for first grade students whereby swimwear varied on the level of protection, with the highest level receiving additional intervention during the summer months, and it was found that the most protected groups experienced fewer moles [23]. European interventions with the same age group as this study, 2 years old to grade school aged young children, have shown that sun protective clothing was able to provide sun protection of a child's body with significantly reduced mole counts when swim shirts were introduced along with other sun protective behaviors like sunscreen [13,24].

Swim shirt voucher redemption or the child already having a swim shirt was associated with being a male child. Boys may have desired the swim shirt because the study signage had the logo of a boy as a sun hero. Since behaviors started as children may persist into adolescence, swim shirt wearing by young adult males may help to provide sun protection for young adult males, who are often reluctant to use sunscreen [2,11].

Differences in the relevance of sun protection and the method of sun protection exist between individuals with different skin tones. Hispanic caregivers may not have been interested in sun protection as they did not perceive the relevance of sun protection because their children did not have skin that was sensitive to the sun, nor did they report that the child's skin became sun burned or irritated from sun exposure. The habits of darker-skinned children's families may be less likely to include sun-safe behaviors due to a lack of awareness or misperceptions regarding skin cancer [25]. Public health education about skin cancer have emphasized the risk of having "fair skin", preventing sunburn, and usually does not show skin cancer on people with skin of color, thus, excluding ethnic minorities [26].

Effective counseling offers sun protection options by restricting outdoor exposure between 10 AM and 4PM, seeking shade when outdoors, wearing protective clothing (hats, long sleeved shirts, long pants, and sunglasses) and/or applying sunscreen with an SPF ≥ 30 . Rouhani et al. found that children of different self-reported ethnicities (non-Hispanic whites, Hispanics, and non-Hispanic blacks) differed in shade-seeking behavior and sunscreen and hat use [27]. Effective

counseling is not always performed because of the lack of sensitivity to cultural preferences regarding sun protection.

Caregivers were more likely to redeem vouchers for swim shirts on days where the UVI was higher as determined by the National Weather Service [15]. As the UVI at noon on the day the voucher was redeemed increased, the number of vouchers for the swim shirt increased, following a linear trend with a dramatic association ($R^2=.552$). A UVI over 3 out of 11 is a threshold value for sunburns [28]. Since many of the caregivers in this study redeemed the vouchers when the UVI was ≥ 7 , caregivers need to be educated about using sun protection when the UVI is ≥ 3 . An additional opportunity for caregiver education would be for those with a personal or family history of skin cancer to realize that their child may be at risk to develop skin cancer, which could be prevented by regular sun protection.

Limitations of the research were the inability to measure change in sunburns or skin irritation in children whose caregiver redeemed a swim shirt, to determine if the \$3 shipping fee deterred redemption of the vouchers, and the potential lack of generalizability to other populations. The study design did not collect data about reasons the caregiver would not use a swim shirt. The intervention itself was limited and varied greatly by pediatric clinicians' styles in delivering the verbal messages.

The study demonstrated the feasibility of pediatric clinicians recommending sun protective clothing for young children aged 2 to 6 years old during sun protection counseling of well children. The age group selected for this study and the pediatric clinician recommendation of sun protection were intended to initiate the behavior in children who are still susceptible to parental care. Elementary school aged children and younger are more receptive to continue implementing sun protective behaviors in the future when they are reinforced early in life [2,29]. The American Academy of Pediatrics has acknowledged that skin cancer prevention is a matter of importance to clinicians and typically is "discussed on at least a few visits over the course of the relationship with a patient" [30]. The increased popularity of swim shirts gives hope that in the future American children will combine the use of protective clothing with sunscreen to achieve effective sun protection [13].

Acknowledgement

The Pediatric Sun Protection Foundation, Inc. provided the sun protective swim shirts and partially supported the research. Mary J. Kwasny, ScD, Department of Preventive Medicine, Biostatistics Collaboration Center, Northwestern University Feinberg School of Medicine, Chicago, IL, provided assistance with the statistical analysis.

This study was registered with ClinicalTrials.gov, NCT02177006.

References

1. Purdue MP, Freeman LE, Anderson WF, Tucker MA (2008) Recent trends in incidence of cutaneous melanoma among US Caucasian young adults. *J Invest Dermatol* 128: 2905-2908.
2. Dadlani C, Orlov SJ (2008) Planning for a brighter future: a review of sun protection and barriers to behavioral change in children and adolescents. *Dermatol Online J* 14: 1.
3. Whiteman DC, Whiteman CA, Green AC (2001) Childhood sun exposure as a risk factor for melanoma: a systematic review of epidemiologic studies. *Cancer Causes Control* 12: 69-82.
4. U.S. Department of Health and Human Services (2014) The Surgeon General's Call to Action to Prevent Skin Cancer. Washington, DC: U.S. Department of Health and Human Services, Office of the Surgeon General.
5. Balk SJ, O'Connor KG, Saraiya M (2004) Counseling parents and children on sun protection: a national survey of pediatricians. *Pediatrics* 114: 1056-1064.
6. Green AC, Williams GM, Logan V, Strutton GM (2011) Reduced melanoma after regular sunscreen use: randomized trial follow-up. *J Clin Oncol* 29: 257-263.

7. van der Pols JC, Williams GM, Pandeya N, Logan V, Green AC (2006) Prolonged prevention of squamous cell carcinoma of the skin by regular sunscreen use. *Cancer Epidemiol Biomarkers Prev* 15: 2546-2548.
8. Cokkinides V, Weinstock M, Glanz K, Albano J, Ward E, et al. (2006) Trends in sunburns, sun protection practices, and attitudes toward sun exposure protection and tanning among US adolescents, 1998-2004. *Pediatrics* 118: 853-864.
9. Saraiya M, Glanz K, Briss PA, Nichols P, White C, et al. (2004) Interventions to prevent skin cancer by reducing exposure to ultraviolet radiation: a systematic review. *Am J Prev Med* 27: 422-466.
10. Mahé E, Beauchet A, de Maleissye MF, Saiag P (2011) Are sunscreens luxury products? *J Am Acad Dermatol* 65: e73-79.
11. Banks BA, Silverman RA, Schwartz RH, Tunnessen WW Jr (1992) Attitudes of teenagers toward sun exposure and sunscreen use. *Pediatrics* 89: 40-42.
12. Harrison S, Beuttner PG, MacLennan R, Woosman J, Hutton L, et al. (2010) Sun-safe clothing helps to prevent the development of pigmented moles—results of a randomized controlled trial in young Australian children. *Ann Aust Coll Trop Med* 11: 50.
13. Smith A, Harrison S, Nowak M, Buettner P, MacLennan R (2013) Changes in the pattern of sun exposure and sun protection in young children from tropical Australia. *J Am Acad Dermatol* 68: 774-783.
14. Stanton WR, Janda M, Baade PD, Anderson P (2004) Primary prevention of skin cancer: a review of sun protection in Australia and internationally. *Health Promot Int* 19: 369-378.
15. UV Index Bulletin. NOAA/National Weather Service, n.d. Web. 1 Aug. 2014. .
16. Crane LA, Deas A, Mokrohisky ST, Ehlsam G, Jones RH, et al. (2006) A randomized intervention study of sun protection promotion in well-child care. *Prev Med* 42: 162-170.
17. Glasser A, Shaheen M, Glenn BA, Bastani R (2010) The sun sense study: an intervention to improve sun protection in children. *Am J Health Behav* 34: 500-510.
18. Hagan JF, Shaw JS, Duncan PM, eds. *Bright Futures—Guidelines for Health Supervision of Infants, Children, and Adolescents*. 3rd ed. Elk Grove Village, Ill: American Academy of Pediatrics; 2008.
19. Geoffrey R Simon, Cynthia Baker, Graham A Barden 3rd, Brown OW, Hardin A, et al. (2014) 2014 recommendations for pediatric preventive health care. *Pediatrics* 133: 568-570.
20. Cohen L, Brown J, Haukness H, Walsh L, Robinson JK (2013) Sun protection counseling by pediatricians has little effect on parent and child sun protection behavior. *J Pediatr* 162: 381-386.
21. Turner LR, Mermelstein RJ (2005) Psychosocial characteristics associated with sun protection practices among parents of young children. *J Behav Med* 28: 77-90.
22. Moyer VA; US. Preventive Services Task Force. (2012) Behavioral counseling to prevent skin cancer: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med* 157: 59-65.
23. Milne E, Johnston R, Cross D, Giles-Corti B, English DR (2002) Effect of a school-based sun-protection intervention on the development of melanocytic nevi in children. *Am J Epidemiol* 155: 739-745.
24. Bauer J, Büttner P, Wiecker TS, Luther H, Garbe C (2005) Effect of sunscreen and clothing on the number of melanocytic nevi in 1,812 German children attending day care. *Am J Epidemiol* 161: 620-627.
25. Battie C, Gohara M, Verschoore M, Roberts W (2013) Skin cancer in skin of color: an update on current facts, trends, and misconceptions. *J Drugs Dermatol* 12: 194-198.
26. Robinson JK, Joshi KM, Ortiz S, Kundu RV (2011) Melanoma knowledge, perception, and awareness in ethnic minorities in Chicago: recommendations regarding education. *Psychooncology* 20: 313-20.
27. Rouhani P, Parmet Y, Bessell AG, Peay T, Weiss A, et al. (2009) Knowledge, attitudes, and behaviors of elementary school students regarding sun exposure and skin cancer. *Pediatr Dermatol* 26: 529-535.
28. Allinson S, Asmuss M, Baldermann C, Bentzen J, Buller D, et al. (2012) Validity and use of the UV index: report from the UVI working group, Schloss Hohenkammer, Germany, 5-7 December 2011. *Health Phys* 103: 301-306.
29. Hunter S, Love-Jackson K, Abdulla R, Zhu W, Lee JH, et al. (2010) Sun protection at elementary schools: a cluster randomized trial. *J Natl Cancer Inst* 102: 484-492.
30. Balk SJ (2011) Council on Environmental Health, Section on Dermatology. Ultraviolet radiation: A hazard to children and adolescents. *Pediatrics* 127: 791-817.

Citation: Bhave N, Reidy K, Randall Kinsella T, Brodsky AL, Robinson JK (2014) Caregivers' Response to Pediatric Clinicians Sun Protection Anticipatory Guidance: Sun Protective Swim Shirts for 2-6 year old Children. *J Community Med Health Educ* 4: 316. doi:[10.4172/2161-0711.1000316](https://doi.org/10.4172/2161-0711.1000316)

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