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Sun Protection Read-Along Books: Assessing the Feasibility of Delivering the Intervention in Pediatrician's Offices

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Abstract

Background: Sun exposure, particularly during childhood, is an important contributing factor in developing melanoma later in life.

Objective: To develop a family-centered, self-reinforcing sun protection educational intervention that supports pediatrician's anticipatory guidance and assess the feasibility of delivering the sun protection intervention in pediatrician offices, and use of sun protection among those receiving the intervention.

Methods: Focus groups and structured interviews with stakeholders supported the iterative design process for the read-along book to be read by caregivers with 2-6 year old children. A feasibility study examined distribution of the read-along books and shirts in pediatrician's offices, whether the books were read and how often, and sun protection used.

Results: The read-along books were distributed to 153 children in two ambulatory office locations. Offices that usually distributed books to enhance literacy distributed the read-along book more than those who did not customarily distribute books. ($p < 0.05$) Sixty-two percent of the caregivers ($n=95$) read the book with their child and 72% of them ($n=68$) read the book more than 5 times in the prior week. After receiving the intervention, caregivers responded that 43.8% ($n=67$) of the children wore a hat, 57.5% ($n=88$) of the children wore the swim shirt, and 13.1% ($n=20$) of the children got sunburn/skin irritation in the past week. The caregivers of all children with a sunburn or skin irritation reported that they did not receive the book ($n=31$) or that they did not read the book ($n=9$). The relationship between the caregiver's education and child's sunburn/skin irritation was significant as was the caregivers' education and the skin type of the child ($p < 0.05$).

Conclusion: Distribution of read-along books in offices that promote literacy by giving books to children was feasible. The book reinforced sun protective behaviors with family-centered, self-reinforcing education with repeated reading at home.

Keywords: Sun protection; Pediatrician; Children; Intervention; Sunburn; Skin irritation

Introduction

Among females 15-19 years old, melanoma accounts for 7% of pediatric cancer, making it the fourth most common cancer in this age group [1]. Melanoma is the fifth most common cancer of men and the seventh most common cancer of women [2]. Sun exposure, particularly during childhood, is an important contributing factor in developing melanoma later in life [3]. Children spend 10% of the day outdoors, and younger children (0-5 years) spend more time outside during the summer than during other seasons [4]. Over a two year period, more than half of the children ages 5-6 were reported to have at least one sunburn [5]. Wearing sunscreen and sun-protective swimwear reduced the number of nevi, which are a biologic indicator that a person is at-risk to develop melanoma later in life [6,7].

Pediatric clinicians, who recognize the importance of reducing sun exposure in young children, may provide age-specific anticipatory sun protection guidance by giving the Bright Futures printed tip sheet to caregivers [8-10]. Among the 30-34.2% of pediatric clinicians, who reported giving sun protection anticipatory guidance to caregivers of 3-6 year olds, most counsel fair-skinned children, children with sun sensitive skin, and children with a family history of skin cancer [8,11]. Sun protection counseling ranked below other forms of education for pediatric patients, including maintaining an active lifestyle and cholesterol control [12]. Many caregivers would like more counseling by pediatricians [11] and reported more regular use of sun protection when they were counseled

[11,13]. Taken together, this information indicated a need to support physicians' sun protection counseling with educational material reviewed at home by caregivers.

Qualitative research with stakeholders explored ways to provide sun protection education. The hypothesis was that a sun protection read-along book would be read in the home by the caregiver with the child, thus, family-centered, self-reinforcing education would aid implementation of age-specific sun protection recommended in the anticipatory guidance tip sheets given to the caregiver. The second hypothesis was that the pediatric staff would give the books to children at the well child visit, thus, demonstrating the feasibility of delivering the intervention. Finally, the intention was to improve sun protection in participants; therefore, orange sun protective swim shirts that were not available in the community were provided as part of the intervention. Additionally, the shirts serve as a proxy for adoption of sun protection related to the intervention.

Methods

This study developed the intervention and assessed the feasibility of delivering it in pediatrician offices and of sun protection usage in an open trial.

Data sources

Focus groups and structured interviews provide the qualitative research data. Eight focus groups consisting of 5-8 female caregivers of 2-6 years old children were conducted in spring 2014. From summer 2014 to winter 2015, structured interviews about sequential iterations of the read-along book and text messages were conducted.

In summer 2015, feasibility research assessed whether two ambulatory pediatric practices distributed the read-along books and swim shirts. Caregivers responded to text messages about receiving and reading the book, and using sun protection, particularly the swim shirts, which served as a proxy for sun protection attributed to the intervention. At the end of four weeks, caregivers were interviewed about reading the read-along book with their children, and receiving and responding to text messages.

All participants provided written informed consent. All aspects of the study were approved by the Institutional Review Boards of Northwestern University and Advocate Health Care.

Participant recruitment

For the focus groups and structured interviews, caregivers were recruited by posting notices in faith-based organizations' bulletins, and providing flyers in schools associated with faith-based organizations. Additional participants for structured interviews were recruited in the medical center by posting flyers in the employee health center, the child day care center associated with the medical center, and on bulletin boards in the Robert Lurie Cancer Center of Northwestern University. Eligibility criteria included being age 18 or older, a caregiver of a 2-6 years old child, and able to read in English or Spanish at a

sixth grade reading level. Flyers and notices stated that focus group participants would receive a \$20 gift card in addition to refreshments. Structured interview participants received a \$50 gift card. People were instructed to call a toll-free number to complete a telephone eligibility interview with study personnel.

For the feasibility research, research assistants invited caregivers of 2-6 years old children to participate during "check-in" for a visit with the pediatrician, through flyers distributed in the Advocate Pediatric Outpatient clinic, and as the caregiver and child waited for the pediatrician to enter the exam room. Caregivers received a \$50 gift card after completing the exit interview.

Focus group process

Focus groups were held in faith-based locations and homes of study personnel. Focus groups ranged in size from four to eight participants. Each group consisted of female participants from one of the following racial/ethnic groups: four groups of Hispanics (two monolingual and two bilingual), two non-Hispanic Blacks, two non-Hispanic Whites, and one Asian. A focus group guide was used for all groups consisting of a series of open-ended questions with supplemental probing questions, organized into the following domains: 1) introduction/background, 2) common activities shared by the caregiver and child, 3) attitudes about sun exposure and sun protection for the adults and children, and 4) sun protection habits of the child. Probing questions about sun protection habits asked about the women's perspective on the feasibility of and acceptance by the child of the following four sun protection options: a) restricting outdoor exposure between 10 AM and 4 PM, b) seeking shade when outdoors, c) wearing protective clothing (hats, long sleeved shirts, long pants, and sunglasses), and/or d) applying sunscreen with an SPF ≥ 30 to body surfaces not covered by protective clothing.

Focus groups were led by a female research assistant of the same race/ethnicity as the participants. An additional observer made field notes during all focus groups. Focus groups lasted from 90 min-200 min, concluding when the participants answered all of the questions and the discussion halted. Focus groups were held until saturation of questions was reached for each race/ethnicity (e.g., saturation of questions in the Hispanic group).

Coding and analysis of focus groups

All focus groups were audio recorded and transcribed verbatim. Transcripts were randomly reviewed for accuracy in transcription. The field notes of the observer, who recorded non-verbal communications, were abstracted. The word files of the transcriptions and field notes were analyzed with Non-numerical Unstructured Data Indexing Searching and Theorizing (NUDIST-QSR) software (version 5, SOLARI). A search for common themes arising a priori within each focus group and by repetition across the focus groups was performed by two coders [14]. Codes were generated from topics identified in the focus group guide and from the data

[15]. After coding the initial transcript, the codes were applied to a new group of participant responses, and the coding scheme was revised to adjust for new responses, and modified codes were applied to the previous set of responses. This process was repeated until no new codes emerged and saturation was achieved. The responses of the two coders were compared and discrepancies resolved to establish inter-rater reliability (Cohen's kappa=0.95).

Structured interview process

Focus group participants identified a common shared activity between the caregiver and the child as reading little picture books together ("over and over"); therefore, a read-along book would be expected to be universally used by all races/ethnicities. The principals of the message learning

approach (The Yale Model of Persuasion) were used to create a read-along book with persuasive messages conveying sun protection concepts [16]. In order to gain the reader's attention, a story portraying a common fun summer outdoor activity, going to the waterpark, was created with easily comprehended colorful illustrations. The read-along book was tested with stakeholders, including parents, child caregivers and child educators, who represented the principal ethnicities and races in the community. After giving written consent, participant responses were anonymously audio-recorded. A trained research assistant used probes to gauge the overall age-appropriateness and cultural sensitivity of the format and content of the book. Based upon collective participant feedback, the read-along book was revised and retested after each structured interview until there were no more suggestions for changes (**Table 1**).

Table 1 Modifications of read-along book based upon structured interviews.

Variable	Initial Concept	Modification
Child engagement		
Ownership of book	Child writes his/her name in the box of "this book belongs to".	Name box made bigger
Identify with the characters	Five characters depict white, black, Asian and Hispanic children of both genders	Name the characters: Paco, Janella, Simon, Amy, and Ben Added Paco's mother to emphasize the importance of sun protection, introduce the shadow rule and sun gear.
	Muscular action heroes characters start by visiting Paco in his room	
	Characters leave to go to the beach	
Learning activities to demonstrate understanding of content and reinforce it with repetition.	Find items by name.	Inserted a standing Paco to cast long and short shadows according to the height of the sun in the sky.
	Count items.	
	Point to body areas to apply sunscreen.	
	Color items.	Deleted coloring activities as they can only be done once.
Content		
Order of content Present the characters	Started with knowledge.	Started with characters
Characters	All children.	Mother added as the source of information and to serve as a role model.
Provide knowledge about		
Ultraviolet radiation	Sun protection keeps the sun from hurting your skin.	Reframed as: Protected skin means healthy skin.
The shadow rule	If your shadow is shorter than you are, go into the shade.	Hurt and harm were barriers.
Sun gear	If you are outside when the sun is strong, be sure to wear your sun gear.	Presented the positive benefits of a smiling sun.
Presentation		
One theme per page	Limit of 10-12 pages	Added a store list for mom
Page layout	Graphics cover most of the page.	Placed the text and activity box in the same location on each page.
	Activity box	
	Text	
Color scheme	Pastel clothing	Bright colors
Text	Limit to 4 lines at top of page	Added character speech bubbles

Language	Sixth grade reading level	Paired sun gear text with graphics: sunglasses, hat, shirt and sunscreen
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Read-along books

Format: The 13-page read-along book used bright colors and large, dynamic graphics to engage the reader. An introductory page introduced each character by name (**Figure 1**). On this page, the child reader, with the help of the adult reader, was encouraged to write his/her name under “This book belongs to”, in order to promote a sense of ownership and engage the child reader with the story. Text, which varies from 1-4 lines, consistently appeared across the top of each story page. Most of the page graphically depicted the sun protection message (**Table 2**). Brief character dialogue was conveyed via comic bubbles. Activities for the child appeared on the bottom left of the page (**Figure 2**). The child characters wear the orange swim shirt that the children were given as part of the intervention. For the adult reader, a page at the end of the book provided more detailed information about shopping for sun gear.

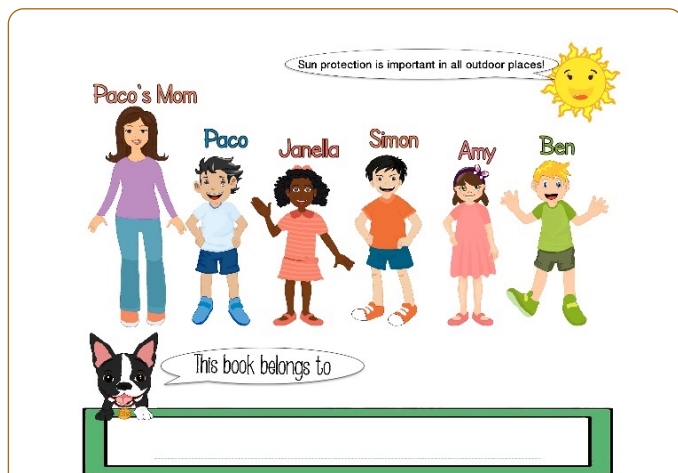


Figure 1 Each of the six story book children characters represented a race/ethnicity: non-Hispanic Black, Hispanic, non-Hispanic White, and Asian. Paco’s mom was included because participants in structured interviews recommended that the mother provided information and served as a role model. The children familiarized themselves with the characters and wrote their name in the box to develop a sense of inclusion within the story frame.

Characters: The read-along book characters were culturally inclusive and represented the following backgrounds: non-Hispanic Blacks, Asians, Hispanics, and non-Hispanic Whites. The child characters were 8-10 years old and served as motivational figures for the 2-6 years old reader. Paco’s mom served as an adult role model; she discussed the importance of sun protection and introduced sun gear and the shadow rule. The Sun, depicted with a friendly smile, conveyed positive reinforcement of the book’s themes. Paco’s dog was included

to enhance reader-relatability and functioned as a comedic element.

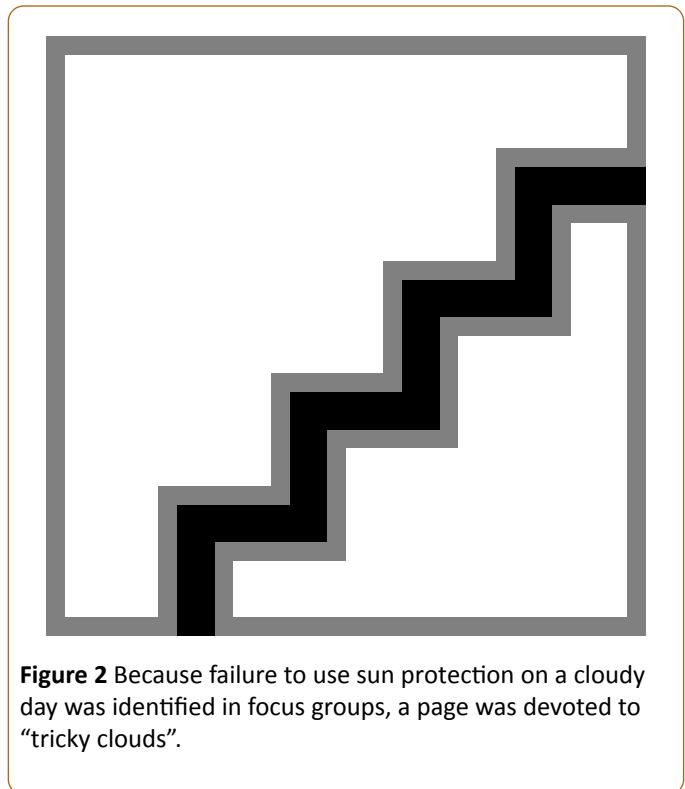


Figure 2 Because failure to use sun protection on a cloudy day was identified in focus groups, a page was devoted to “tricky clouds”.

Content and language: The content of the book was easily understood with comic book style graphics depicting scenes to facilitate understanding of the story independently of the text. The dialogue fostered inclusivity and encouraged positive motivators, with phrases such as, “People of all skin tones need to use sun protection”, “It’s time we all put on sunscreen”, and “After we get out of the pool, we all need to put on sun gear again” (**Figure 2**). Caregivers indicated that they had never heard of the shadow rule and it would be great for children who cannot tell time (**Figure 3**).

Feasibility of delivering the intervention: Pediatric staff were interviewed about the likelihood of distributing the read-along books and how best to accomplish this. In addition, the staff was asked about distributing sun protective swim shirts and sunscreen.

Caregiver implementation of sun protection: At the completion of the visit with the pediatrician, caregivers completed a short written survey. Staff gave the children a read-along book in either English or Spanish and a swim shirt. Hats and sunscreen were not provided. Caregivers responded to four weekly text messages and one-month after receiving the intervention materials they participated in a telephone interview that included their assessment of the read-along

book and estimated how many times in the last month they read the book with the child.

Table 2 Read-along book themes by page.

Page No.	Focus	Graphics
1	Paco's First Trip to the Waterpark engages the readers in a fun outdoor activity.	Paco going down a waterslide
		Four other children jumping into the pool
		All wear sun protective shirt
		Smiling sun
2	Engender ownership and identification with characters	Six smiling characters are given names: Paco's Mom, Paco, Janella, Simon, Amy, and Ben
		The box for the child's name is held by a dog.
		Sun says: Sun protection is important in all outdoor places!
3	Knowledge about the sun	Sun is shown as center of solar system.
		Sunlight supports life by helping plants to grow.
4	Shadow Rule: If you are outside when the sunlight is strong, be sure to wear your sun gear.	Sun moving through the sky casting different lengths of Paco's shadow.
		Four pieces of sun gear: sunglasses, hat shirt and sun screen
5	Set the stage of the story: a warm sunny day, in Paco's bedroom	Sun gear is scattered around the bedroom.
6	Story progresses with Paco's friends arriving in his bedroom. Umbrella will give cool shade during hottest parts of the day	The dog wears a wide brimmed hat that covers her ears.
7	Put on sunscreen 20 minutes before going outside.	Characters apply sunscreen.
8	Story progresses with arrival at waterpark. Remember the shadow rule.	Each character carries or wears the sun gear item identified with them. Paco (hat), Janella (sunglasses), Simon (umbrella), Amy (sunscreen), and Ben (shirt)
9	Story moves to locker room	Characters change into swim shirts and apply sunscreen to spots they missed.
10	Story moves to under a tent with a weather board	Clear sky, partly cloudy and cloudy illustration of the sun rays.
11	Story moves to getting out of the pool.	Need to put on sun gear. Advantage of sun stick that does not wash off easily.
12	Story moves to leaving the waterpark.	Each character holds a sign with his/her sun gear.
13	Mom's store list.	Details of four sun gear items

Intervention measures

Demographics: At baseline, caregivers answered questions related to their own demographics including age, gender, mother and father's education level, income level, race and ethnicity. Caregivers also reported on child's demographics of age and gender.

Child's skin color: To assess the color of each child's skin, the caregiver used the printed survey item with color bars to select the color range that most closely matched the skin of child's upper inner arm and circled the number beside the color bar (1 through 6) [17]. This number was then re-categorized by the level of potential skin burn or irritation. Children with a score of 1 and 2 were grouped together, as they can easily burn; children with a score of 3 and 4 were coded as one group because they will normally obtain skin irritation as opposed to sunburn; and children that were scored with a 5 or 6 were

grouped together since they are unlikely to have either sunburn or sun irritation.

Children's skin sensitivity: Caregivers were asked to respond using a five-point scale ranging from Strongly Disagree to Strongly Agree to the statement: "This child's skin is sensitive to the sun".

Text-message questions: Caregivers were text-messaged a question once a week for four weeks after their baseline visit. They were asked to respond by texting back "yes" or "no" to the question. On week one, the question asked, "Did you receive the book? Did you read the book with your child?" On week two, the question asked, "During the past week, did your child regularly wear a hat?" The third week, caregivers were texted the question, "During the past week, did your child regularly wear the orange swim shirt that was given to you during your visit with the pediatrician?" Lastly, on week four,

caregivers responded to the question, "In the past week, did your child get a sunburn or skin irritation on even a small part of skin?" The orange swim shirts provided by the research assistant, which were not available in the community, served as a proxy for sun protection attributed to the intervention.

"Remember, the shadow rule: If your shadow is shorter than you are, go into the shade. If you are outside when the sun is strong, be sure to wear your sun gear," said Mom.



Figure 3 The shadow rule is able to be used by children who cannot tell time.

Exit Interview: Caregivers were asked to assess the strengths and weaknesses of the read-along book and estimate how many times in the last month someone read the book with the child.

Data analysis plan

First, we calculated the percentage of caregivers who responded "yes" to the four text-messaged questions for the overall sample. Second, we examined if the "yes" responses to the text-messaged questions varied by caregiver and child baseline demographics by conducting chi-squared tests. Lastly, we compared baseline reports of child skin sensitivity between caregivers who responded "yes" to those who responded "no" to each of the four text-messaged questions with independent t-tests.

Results

Characteristics of focus groups and structured interview population

Two hundred-fourteen women requested more information. There were 210 eligible women. Fourteen women were ineligible due to the age of the child. In order to assure representation of the non-Hispanic Whites, Hispanics, and non-Hispanic Blacks, stratified recruitment was performed. Of the 210 women, 72 were White and 30 participated for a participation rate of 42%; 51 were Hispanic, 26 participated for a participation rate of 51%; 80 were non-Hispanic Blacks, 22 participated, for a participation rate of 27%; and 7 were Asian, 7 participated, for a participation rate of 100%.

Focus groups: Each of the eight focus groups of women consisted of a single race/ethnicity. The total number participating was 55 with 12 non-Hispanic Blacks, 20 Hispanics, 16 non-Hispanic Whites, and 7 Asians.

Structured interviews: A total of 33 structured interviews were conducted with ten men and twenty-three women. The race/ethnicity representation was as follows: 3 Asians, 10 non-Hispanic Blacks, 14 non-Hispanic Whites and 6 Hispanics.

Focus groups themes

All focus groups noted that young children were often cared for by older women relatives or women in the neighbourhood. A common shared activity was caregivers and children repeatedly reading little picture books together (read-along book). Secondary themes were lack of importance of sun protection in people with skin of color and failure to use sun protection on cloudy days.

Read-along book structured interviews with stakeholders

Characters: Neither the character's graphic representations nor names were offensive to the structured interview participants. The participants of the structured interviews praised the characters for explaining the proper ways in which to use sun protection and stated that the child could readily model their own behavior after the characters in the book.

Content and language: Text on the 13 pages was provided in English and Spanish and evaluated with the Flesch-Kincaid test to assure that the grade level did not exceed third grade reading level. Participants of the structured interviews stated that, while reading aloud to their children, they routinely "fill in the gaps" in content and employed the use of shared experiences to facilitate comprehension. Most participants acknowledged that "not all children 2-6 years old will understand [the information provided], but the adult reader will know how to appropriately explain the concepts to them". One father reported, "I like to explain everything to my 3 year-old son and will take the time to go over it slowly. [My son] may not understand it all, but he often understands more than I think".

Participants discussed the importance of avoiding the use of trigger words. For example, the words "harmful", "hurt", and "bad" served as negative constructs, which may communicate fear, rather than motivation, to 2-6 years old children. These phrases were replaced by positive messages, such as, "We need to protect our skin from UV rays because they can make our skin unhealthy", "Protected skin means healthy skin", and "I'm glad I learned how to protect my skin from the sun".

Caregivers' and children's use of the read-along books

The read-along books were distributed to 153 caregivers. Most caregivers were female and non-Hispanic White (**Table 3**). Almost 2/3 of caregivers (n=95; 62.1%) responded that they

received the book and read the book with the children in the past week. Of the remaining caregivers, some could not recall receiving the book (n= 31, 20.3%). Some recalled receiving the book and stated that the child read it with an older sibling (n=18, 11.8%). The remainder recalled receiving the book but did not believe anyone read it with the child (n=9, 5.9%). In the end of the study interviews, among the 95 caregivers, who

recalled reading the book with the child, the frequency was as follows: 68/95 (72%) more than 5 times, 24/95 (25%) about 3 times, and 3/95 (3%) at least once in the prior week. Caregivers related making up stories about the characters in the book with the child.

Table 3 Caregiver characteristics and associations with intervention components.

Variable	%	Read book	Child wore hat	Child wore swim shirt	Child sunburn/ skin irritation
Caregiver N=153	N (%)	95 (62.1%)	67 (43.8%)	88 (57.5%)	20 (13.1%)
Relationship to child					
Mother	140 (91.5%)	85 (60.7%)	60 (42.9%)	82 (58.6%)	20 (14.3%)
Father	13 (8.5%)	10 (76.9%)	7 (53.8%)	6 (46.2%)	0 (0.0%)
χ^2	-	0.01	0.57	0.07	2.48
Age, y (mean age)					
16-30	41 (26.8%)	27 (65.9%)	18 (43.9%)	24 (58.5%)	8 (19.5%)
31-40	100 (65.4%)	62 (62.0%)	46 (46.0%)	25 (25.0%)	11 (11.0%)
41-50	12 (7.8%)	6 (50.0%)	3 (25.0%)	4 (33.3%)	1 (8.3%)
>50	5 (3.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
χ^2	-	4.70	2.14	0.86	3.19
Highest level of education-mother					
Some High School	7 (4.6%)	2 (28.6%)	1 (14.3%)	3 (42.9%)	3 (42.9%)
High School Graduate	19 (12.4%)	13 (68.4%)	10 (52.6%)	11 (57.9%)	4 (21.1%)
Some Post-High School Education	27 (17.6%)	17 (63.0%)	13 (48.1%)	14 (51.9%)	0 (0.0%)
College Graduate or Advanced Degree	100 (65.4%)	63 (63.0%)	43 (43.0%)	60 (60.0%)	13 (13.0%)
χ^2	-	4.19	3.53	0.244	12.08**
Highest level of education-father					
Middle School 7th,8th, 9th grade	2 (1.3%)	1 (50.0%)	0 (0.0%)	1 (50.0%)	0 (0.0%)
Some High School	14 (9.2%)	7 (50.0%)	11 (78.6%)	11 (78.6%)	3 (21.4%)
High School Graduate	26 (17.0%)	19 (73.1%)	11 (42.3%)	16 (61.5%)	2 (7.7%)
Some Post-High School Education	20 (13.1%)	11 (55.0%)	9 (45.0%)	11 (55.0%)	1 (5.0%)
College Graduate or Advanced Degree	86 (56.2%)	52 (60.5%)	33 (38.4%)	44 (51.2%)	13 (15.1%)
No Response	5 (3.3%)	5 (100%)	3 (60.0%)	5 (100%)	1 (20.0%)
χ^2	-	4.75	5.62	10.20	2.16
Annual household income					
\$10,000 - \$19,999	13 (8.5%)	9 (69.2%)	6 (46.3%)	8 (61.5%)	2 (15.4%)
\$20,000 - \$34,999	29 (19.0%)	17 (58.6%)	11 (37.9%)	18 (62.1%)	2 (6.9%)
\$35,000 - \$50,999	19 (12.4%)	12 (63.2%)	8 (42.1%)	12 (63.2%)	1 (5.3%)
\$51,000 - \$100,000	39 (25.5%)	21 (53.8%)	18 (46.2%)	22 (56.4%)	4 (10.3%)
Over \$100,000	32 (20.9%)	26 (81.3%)	15 (46.9%)	17 (53.1%)	4 (12.5%)

Did Not Wish to Respond	21 (13.7%)	10 (47.6%)	7 (33.3%)	10 (47.6%)	7 (33.3%)
χ^2	-	11.08t	3.64	8.99	7.57
Hispanic					
Yes	40 (26.1%)	24 (60.0%)	18 (45.0%)	23 (57.5%)	5 (12.5%)
No	110 (71.9%)	69 (62.7%)	46 (41.8%)	63 (57.3%)	14 (12.7%)
No Response	3 (2.0%)	2(66.7%)	3 (100%)	2 (66.7%)	1 (33.3%)
χ^2	-	1.50	3.12	1.44	0.63
Race					
White	99 (64.7%)	59 (59.6%)	48 (48.5%)	61 (61.6%)	11 (11.1%)
Black	20 (13.1%)	16 (80.0%)	10 (50.0%)	8 (40.0%)	3 (15.0%)
Asian or Pacific Islander	19 (12.4%)	12 (63.2%)	3 (15.8%)	13 (68.4%)	4 (21.1%)
Mixed Race	5 (3.3%)	2 (40.0%)	2 (40.0%)	1 (20.0%)	1 (20.0%)
No Response	10 (6.5)%	6 (60.0%)	4 (40.0%)	5 (50.0%)	1 (10.0%)
χ^2	-	4.91	8.47	3.66	2.76
Child characteristics					
Age					
2-3	54 (35.3%)	35 (64.8%)	19 (35.2%)	29 (53.7%)	9 (16.7%)
>3-4	26 (17.0%)	14 (53.8%)	15 (57.7%)	17 (65.4%)	19 (73.1%)
>4-5	27 (17.6%)	18 (66.7%)	13 (48.1%)	15 (65.4%)	14 (51.8%)
>5-6	46 (30.1%)	28 (60.9%)	20 (43.5%)	27 (55.6%)	4 (8.7%)
χ^2	-	3.18	3.57	1.46	4.00
Gender					
Male	69 (45.1%)	47 (68.1%)	34 (49.3%)	42 (60.9%)	11 (15.9%)
Female	84 (54.9%)	48 (57.1%)	33 (39.3%)	46 (54.8%)	9 (10.7%)
χ^2	-	1.39	3.20	1.68	0.83
Skin color					
1-2	114 (74.5%)	66 (57.9%)	52 (45.6%)	70 (61.4%)	13 (11.4%)
3-4	31 (20.3%)	24 (77.4%)	11 (35.5%)	14 (45.2%)	7 (22.6%)
5-6	7 (4.6%)	4 (57.1%)	3 (42.9%)	3 (42.9%)	0 (0.0%)
No Response	1 (0.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
χ^2	-	3.47	4.32	4.18	3.20

Children's use of sun protection

For skin protection behaviors, 43.8% (n=67) responded that their child regularly wore a hat, and 57.5% (n=88) responded that in the past week their child regularly wore the orange swim shirt that they were given as part of the intervention. Sustaining a sunburn or skin irritation from the sun is a proxy for inadequate sun protection. Thus, the 13.1% of caregivers (n=20), who responded that their child got sunburn or skin irritation in the past week, provided inadequate sun protection. The caregivers of all of the children with a sunburn or skin irritation reported that they did not receive the book

(n=31) or that they did not read the book (n=9). Caregivers who reported that they read the book with the child had a higher percentage of reporting regularly wearing the swim shirt than those who did not read the book with the child ($\chi^2(1, N=153)=19.65, p=0.01$) (Table 3).

The relationship between the level of the Mother's education and children's sunburn/skin irritation was significant ($\chi^2(1, N=153)=11.65, p=0.007$). Mother's higher level of education was associated with the children having skin types 1-2, which readily sunburns ($\chi^2(1, N=153)=15.05, p=0.001$). None of the other caregiver or children demographics impacted caregiver engagement in reading the intervention

book or reports of their children wearing a hat, wearing the swim shirt or having sunburn/sun irritation.

Lastly, comparisons of baseline reports of the children’s skin sun sensitivity between caregivers who responded “yes” to those who responded “no” to each of the four text-messaged

questions revealed no significant differences (all t’s <1.96; all p’s>0.10).

The exit interviews conducted with caregivers indicated appreciation of the key messages in the books (**Table 4**).

Table 4 Summary of comments about the read-along book.

Caregiver comment
Positive comments
“The book is very useful and informative. My kid and I loved reading it together. Learned a lot about sun protection. Thanks for the wonderful book”.
“My daughter liked me reading it to her because it talked about the waterpark and friends” (Translated from Spanish).
“I enjoyed the book. It gives good information. Thank you!” (Translated from Spanish)
“I learn a lot of stuff from the book, especially about protecting on a cloudy day. And my children now know how important is to protect themselves from sun”.
“The sun program is educational and it gives parents a good guide to protect kids from the sun’s harm”.
“My kids enjoyed the book and it opened up lines of communication”.
“My son really enjoyed the story about Paco. We read it a lot. I would keep using the book”.
Negative comments
“Provide a book for younger child- it was a little difficult for a 2 year old to understand”.
“The paper tore after many uses. The book needs stronger paper”.
Child comment
Positive comments
[In excitement upon receiving the read-along book]... “Another book? For me?”
“Oh, look at the dog.”

Feasibility of delivery in pediatric clinical settings

Structured interviews with pediatric nursing staff found that one ambulatory office routinely gave age-appropriate books to promote literacy and numeracy to children. Nursing assistants, who were in the habit of distributing age-appropriate books to children at each well child visit, added the read-along book to the available material in the storage cabinet. (n=10) After completing the visit with the pediatrician in the examination room, children were taken to the book storage cabinet on the way to the check-out desk. Nursing assistants, who did not distribute books to children, had difficulty envisioning how to distribute it. (n=12).

Nursing staff was unwilling to engage in providing sun protective swim shirts or sunscreen for the children. They felt it would be too great a burden to get the right size shirt for each child and they did not want the children opening sunscreen and getting it all over the office.

Research assistants distributed the shirt at the check-out desk and checked to be sure each child received a read-along book. At the ambulatory office location with a book storage cabinet, 95% of children received a read-along book. At the location without a book storage cabinet, nursing staff distributed the read-along book to 12% of children. (p=0.001).

Discussion

This feasibility study determined that the read-along book was read by 62% of the caregivers with their children and 72% of those who read the book with their children did so more than 5 times in the prior week. The intervention also provided a sun protective swim shirt, which was regularly worn by 57% of those receiving the read-along book and the swim shirt. Lastly, this study identified that distribution of swim shirts, hats, and sunscreen by the pediatric staff was not sustainable; however, offices that routinely distribute books to enhance literacy can readily incorporate a read-along book with a sun protection message during seasonally appropriate times of the year.

Since young children depend on their caregivers for sun protection, our principal approach was to engage caregivers in sun protection education with their children by reading the book together. Providing Paco’s First Trip to the Water Park promoted awareness of sun protection and encouraged the use of the sun protection behaviour(s) relevant to the child and caregiver. The caregiver and the child actively engaged with a story relevant to their own experiences and embellished the story by telling their personal experiences. Repetitively reading the book with the caregiver may reinforce the importance of the use of sun protection with the child. The

read-along book used the waterpark setting, which was easily identified as a fun summer activity for children.

Others have performed sun protection research with young children. A study with 8-year-old children demonstrated that educational materials significantly increased the child's knowledge of sun protection. Thornton and Piacquadio [18] distributed *A Day with Ray*, an educational picture book, to a third grade class in the San Diego, CA school district, wherein rhymes with a third-grade reading level emphasized the dangers associated with failure to use sun protection and included scenarios relevant to 8-year-olds. Similarly, a storybook with the Wiggles characters, popular children's characters from the Australian children's television program *Dorothy the Dinosaur and her Magic Hat*, appealed to 2-3 years-old children and their caregivers, and encouraged the acceptance and adoption of wearing protective clothing and applying sunscreen [19]. The Wiggles storybook was designed in response to an Australian survey regarding the sun-safety practices of caregivers for their children. Caregivers expressed concern regarding their inability to get their toddlers to wear protective clothing [19,20]. Of the two-hundred-and-thirty children who received the Wiggles storybook, 86% of parents expressed that the storyline's use of familiar characters influenced their children's compliance with wearing protective clothing [19]. Rather than using currently popular characters, that may become unrecognizable in time, we chose aesthetically pleasing characters in *Paco's First Trip to the Waterpark*. The characters depicted both genders and all races and ethnicities to emphasize the importance of practicing sun safety for those with skin of color that have skin that does not sunburn but does feel irritated after sun exposure. The children's identification with characters may have elevated their responses to the storyline and developed a meaningful connection that elicited behavioural changes to match those of the character(s). Paco and his friends were designed to be role models to encourage and motivate the children to adopt the protective behaviours engaged in by the characters. Identifying with the book characters as they experienced scenarios, such as reapplying sunscreen and putting on hats after being in the pool, further reinforced the importance of sun protection when participating in outdoor activities.

The read-along book presented the four types of sun protection to facilitate caregivers' choosing the one(s) best suited to their families and the ones easy for their children to adopt. For example, people with skin of color often chose protective clothing based on their negative experience with sunscreen leaving white streaks on their skin. The read-along book was offered in two languages (Spanish and English) and included a list of recommended sun protection products for the caregiver with forms of sunscreen (i.e. spray, bar, and lotion) and protective clothing (i.e., hats, swim shirts, sunglasses). Furthermore, the read-along book provided comic-book illustrations to make the content understandable independent of the reading level of the child and/or caregiver, thus, fostering comprehension and knowledge. Sun protective swim shirts were provided, but hats and sunscreen were not provided as they are available in the community. The difference in use of hats (43.7%) and shirts (57.5%) may be

attributed to the shirt being provided as part of the intervention.

Other child health and safety national campaigns have used read-along books. The Council of Europe's *The Underwear Rule* [21] was designed to educate caregivers and children on the prevention of sexual abuse during childhood. The campaign's accompanying read-along book, *Kiko and the Hand*, provided a fun and playful story explaining a child's right to denounce inappropriate touching [22]. Similarly, an inexpensive comic book was produced and distributed in West Bengal, India and West Virginia, USA to educate 5-7 years-old students about thermal burn safety; a pre-test and post-test determined that the students improved their understanding and knowledge of burn safety and prevention after reviewing the comic book [23].

Limitations

The study is not without some limitations. While the feasibility study demonstrated the ability of pediatric staff to distribute the read-along book during the pediatric clinical activities, the effectiveness of the intervention needs to be evaluated with a randomized controlled trial. It was not possible to assess whether the number of repetitive readings was associated with greater sun protection among the 2-6 years children. Since the caretakers self-reported the information, the data may have report bias. Lastly, a remaining question is whether the sun protection behaviours, including swim shirt wearing, initiated with 2-6 years old children will be sustained as the children become pre-teens. It will be important to assess whether adoption of wearing swim shirts by the majority of children in the community shifts normative beliefs in the local community and helps to sustain the behaviour into pre-teen years.

Conclusion

Paco's First Trip to the Waterpark built upon the tradition of health promotion with read-along books by emphasizing the importance of sun safety. Our read-along book used family-centered, self-reinforcing education. Since children's adoption of sun protection behaviour(s) may be influenced by the caregivers, our intervention focused on culturally and age appropriate information for caregivers to share with children in order to foster children's engagement in sun-protection by putting on a swim shirt, sunscreen, and/or a hat and seeking shade.

Practice Implications

Reading aloud with young children strengthens child-parent relationships, increases a child's vocabulary, and lays the foundation for future learning and language development [24]. The American Academy of Pediatrics recommends that pediatric providers promote early literacy development at health supervision visits for children, and has instituted the adoption of literacy programs such as the Reach Out and Read Program [23]. Read-along books, such as *Paco's First Trip to the*

Waterpark, can be distributed by pediatric staff to promote literacy and to communicate about sun protection, a health prevention topic that may not be fully discussed during a wellness visit. Educational read-along books can be used in conjunction with existing literacy efforts to instil and reinforce healthy behaviours in both parents and children.

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