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## ORIGINAL ARTICLE

### Creation of the «soludable» sun protection accreditation program for schools<sup>☆</sup>



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#### KEYWORDS

Skin cancer;  
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#### Abstract

**Introduction:** Sun exposure during childhood is the main risk factor for skin cancer in later life. School-based sun protection policies and practices have proven to be the most effective and cost-effective strategies for preventing skin cancer.

**Objective:** To develop a sun protection accreditation program known as «Soludable» (a play on the Spanish words sol [sun] and *saludable* [healthy]) to objectively identify schools that actively promote sun protection behaviors among students.

**Methods:** The consensus method used was a 2-round Delphi technique with input from a panel of experts. We then calculated the median scores for the importance and feasibility of each of the recommendations proposed and the level of complexity assigned to each recommendation by counting the percentage of experts who chose each difficulty category.

**Results:** The resulting accreditation model consists of 14 recommendations with corresponding evaluation criteria divided into 7 domains: 1) organizational leadership (5 recommendations), 2) effective communication (2 recommendations), 3) structural elements (2 recommendations), 4) training of professionals (1 recommendation), 5) school curriculum (1 recommendation), 6) behavioral models (2 recommendations), and 7) student habits (1 recommendation). A high level of agreement among experts was observed for all recommendations, in terms of both their perceived importance and feasibility and their categorization by levels of complexity.

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**PALABRAS-CLAVE**

Cáncer de piel;  
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Educación escolar;  
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**Conclusions:** This is the first sun protection accreditation program developed for Spanish schools. Studies are needed to evaluate how this program is received and how it affects students' sun protection behaviors.

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### Creación del distintivo Soludable: un modelo de certificación en fotoprotección para centros escolares

#### Resumen

**Introducción:** La exposición solar en la infancia es el principal factor de riesgo para el desarrollo de cáncer de piel en la vida adulta. Las intervenciones basadas en programas y políticas de fotoprotección escolar han demostrado ser las estrategias más eficaces y coste-efectivas para la prevención del cáncer de piel.

**Objetivos:** Elaborar un modelo de certificación que permita identificar de forma objetiva aquellos centros escolares que promueven activamente la fotoprotección.

**Metodología:** Se empleó metodología de consenso basada en panel de experto, recurriendo al método Delphi en dos rondas. Se analizaron las medianas de las valoraciones de la importancia y factibilidad de cada una de las recomendaciones, y el porcentaje de respuestas positivas para los niveles de cada una de las mismas.

**Resultados:** Se obtuvo un modelo integrado por 14 recomendaciones junto a sus criterios de evaluación, relativas a 7 dimensiones: 1) Liderazgo organizacional (5 recomendaciones), 2) Comunicación efectiva (2 recomendaciones), 3) Elementos estructurales (2 recomendaciones), 4) Formación de profesionales (1 recomendación), 5) Currículum escolar (1 recomendación), 6) Modelos de conducta (2 recomendaciones), y 7) Hábitos del alumnado (1 recomendación). Todas las recomendaciones mostraron un alto nivel de acuerdo, tanto en la valoración de la importancia y factibilidad como en la categorización de los niveles de complejidad.

**Conclusión:** Se trata del primer distintivo de fotoprotección escolar que se desarrolla en nuestro país. Se necesitan estudios que evalúen el grado de aceptación de la estrategia y su impacto en los hábitos de fotoprotección de los escolares.

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## Introduction

The worldwide incidence of skin cancer has increased year on year by between 3% and 8% since 1960.<sup>1</sup> In line with this trend, the incidence of skin cancer in Spain has tripled between 1978 and 2007.<sup>2</sup> Excessive exposure to ultraviolet radiation, whether from the sun or artificial sources, is the main avoidable cause of skin cancer,<sup>3</sup> and childhood is a critical period of risk: one or more episodes of sunburn during childhood doubles the risk of melanoma later in life.<sup>4</sup>

Education in healthy habits in terms of sun protection is the best strategy for preventing skin cancer.<sup>5</sup> Educational programs such as SunSmart School in Australia,<sup>6</sup> SunWise in the United States,<sup>7</sup> or SolSano in Spain<sup>8</sup> have raised awareness and improved behaviors in sun protection in school children, and also reduced sunburn in the target population. These programs have also been shown to be the most cost-efficient. The SunWise program, run by the United States Environmental Protection Agency, is estimated to provide a return of 2–4 dollars in savings in medical care costs and productivity losses for every dollar invested.<sup>7</sup>

The World Health Organization encourages governments to develop policies for sun protection (focused on the school curriculum, shade, time of day spent with outdoor activities, school uniform, use of headwear, sunglasses, and sunscreen)

when children participate in outdoor activities and the ultraviolet index (UVI) is greater than or equal to 3. Likewise, it recommends creating accreditation systems with public recognition for those schools with suitable measures as a means to encourage them to promote the use of sun protection measures.<sup>9</sup> Certification of sun protection was initiated in schools in countries such as Australia, New Zealand, United States, and Germany with good uptake and excellent outcomes in nurseries and primary schools.<sup>10–12</sup>

In the present article, we describe the process of creating the *Soludable* (a play on the Spanish words *sol* [sun] and *saludable* [healthy]) accreditation program, as a model for certifying sun protection developed in Andalusia. This project is one of the initiatives of the sun protection campaign "Enjoy the sun while saving your skin,"<sup>13</sup> whose objective is to promote policies and healthy sun protection practices in schools with involvement of the entire educational community.

## Methods

The Delphi consensus method used to draft the text of the consensus program with a panel of experts.<sup>14</sup> Before starting on the text, the context was drafted and the scope and timing of the project determined, seeking input from

persons responsible in the Health Promotion Service (Health Department), Service of Planning and Educational Programs (Education Department), and the Patient Safety Monitoring System of the Andalusian Agency for Health Quality (Health Department), and Andalusian regional government. A multidisciplinary panel of experts was then selected and the members committed to collaborating with the project. This panel comprised 17 healthcare professionals with experience in primary skin cancer prevention and development of educational interventions about sun protection measures; 4 education professionals with experience as teacher consultants and implementation of sun protection education programs; and 1 volunteer from the *Asociación Española Contra el Cáncer* (Spanish Cancer Association).

In a first phase, a coordinating group performed a literature search to collect the best recommendations and experience in Spanish and international school sun protection programs. The SunSmart School sun protection policies<sup>15,16</sup> were selected to form the basis for a preliminary proposal for recommendations for the accreditation program, in view of the quality of the documentation and the results obtained after more than 20 years of experience in the sector. Work on the consensus took place between January and June of 2015, in sequential phases alternating between face-to-face meetings and online exchanges (using the 2-round Delphi technique).

In the first face-to-face meeting, the proposal and project objectives were presented to the experts in order to assess whether all the recommendations that should be considered were indeed appropriately formulated (clear and concise language), whether all key players were involved, and whether the recommendations could be measured and assessed. The recommendations should define objective facts or actions that enable distinction between schools that actively promote sun protection and those that do not. Alongside the recommendations, their goals should be explicitly described. For this purpose, 4 working groups were formed with a coordinator and spokesperson. Each group worked on a series of recommendations to be subsequently presented to the other groups in a plenary session. Two coordinators took note of all the observations and drafted a final report with the conclusions.

In a secondary face-to-face meeting, an expert panel defined the assessment criteria for each of the selected recommendations. Following the same approach as in the previous meeting, 4 groups were formed with a coordinator and spokesperson. Each group worked on a set of recommendations, for which at least one objective and measurable assessment criterion was to be designated. Subsequently, all panel members discussed the assessment criteria in their entirety and the degree of difficulty of the recommendations; finally, a name was proposed for the accreditation program.

For the online phase, a survey was set up using SurveyMonkey in order to assign priority to the recommendations, establish degrees, and select the name of the future accreditation system. The recommendations were scored according to importance and feasibility with a 5-point Likert scale (not at all important or feasible, very little, occasionally, usually, and always). In addition, the degree of difficulty of each recommendation was assessed, with basic recommendations considered as level I and advanced ones as level II. Finally,

the survey was used to choose a name for the accreditation program from among those proposed in the second face-to-face meeting. The panelists had 10 days to complete the survey.

## Statistical analysis

Median scores were calculated for assessment of both importance and feasibility of each recommendation, as well as for the percentage of options of degrees of each recommendation. Agreement for inclusion of the recommendation in the model was considered to have been reached when the score of the sum of medians for assessment of importance and feasibility was greater than or equal to 7. Likewise, agreement for the level of recommendation was considered reached when the percentage of the option for the degree was greater than 50%.

## Results

Table 1 shows the 25 recommendations formulated initially by the coordinating group, grouped into 7 domains: 1) organizational leadership (7 recommendations); 2) effective communication (2 recommendations); 3) structural elements (3 recommendations); 4) training of professionals (3 recommendations); 5) school curriculum (2 recommendations); 6) behavioral models (2 recommendations); and 7) protection habits (6 recommendations).

Table 2 shows the 14 recommendations selected and reformulated by the expert panel after the first face-to-face meeting, along with the aims and criteria defined in the second face-to-face meeting, and grouped in 7 domains: 1) organizational leadership (5 recommendations); 2) effective communication (2 recommendations); 3) structural elements (2 recommendations); 4) training of professionals (1 recommendation); 5) school curriculum (1 recommendation); 6) behavioral models (2 recommendations); and 7) protection habits (1 recommendation).

Table 3 shows the results of the first Delphi round, in which 19 of the 22 panel members participated. All recommendations reached the established level of agreement, with median scores for assessing the importance and feasibility greater than or equal to 3, and greater than or equal to 7 for the combined median of both components. In addition, in 4 of the recommendations, the median combined score was the maximum possible (median 10 points: 1.1, 1.2, 2.1, and 2.2).

Table 4 shows the results of the second Delphi round, in which 17 of the 22 panel members participated. All recommendations reached the established level of agreement, with a percentage of coincidence greater than 50%. Of the 14 recommendations, 7 were classed as basic or level I (1.1, 1.2, 1.5, 2.1, 2.2, 5.1, 6.1) and the remaining 7 as advanced or level II (1.3, 1.4, 3.1, 3.2, 4.1, 6.2, 7.1).

Finally, of the 5 proposals for the name of the accreditation program, the one with the most support was *Soludable* (as mentioned above, a play on the Spanish words *sol* [sun] and *saludable* [healthy]).

**Table 1** Preliminary recommendations.

Domain	Item no. by domain	Recommendation
Organizational leadership	1.1	The school has written documentation of sun protection policies that covers the recommendations.
	1.2	The sun protection policies are visible throughout the school
	1.3	The school conducts diagnosis and audits of its shade
	1.4	The school and staff organize outdoor activities in shady areas
	1.5	The school actively encourages the use of sun protection measures throughout the educational establishment
	1.6	The school board periodically reviews compliance with the sun protection policies
	1.7	The school conducts continuous assessment of attitudes towards encouraging sun protection, shade, and the importance of these attitudes in the school curriculum
Effective communication	2.1	The school informs the educational community about its sun protection policy
	2.2	Communications with the educational community related with outdoor activities will include sun protection recommendations
Structural elements	3.1	The schools have shady areas in outdoor recreational facilities
	3.2	The school provides a daily program of outdoor activities, avoiding the midday sun (12h-16 h)
	3.3	The school reports the local UV index daily to the school community
Training of professionals	4.1	All school staff and social workers are aware of the policy and importance of sun protection in the context of the school
	4.2	Sun protection is included in the teacher training program
	4.3	Sun protection is included in the school's educational project
School curriculum	5.1	Education about sun protection is included in the appropriate areas of the school curriculum
	5.2	Creativity is encouraged regarding the sun protection criteria by holding a reference day
Behavior models	6.1	Whenever the UV index is greater than 3, staff (opinion leaders or leaders for any school activity, both during and outside the school day) lead by example, adopting a series of protective measures (hat, clothes, glasses, broad spectrum permanent sunscreen > factor 30 when they are outside) and avoiding excessive tanning
	6.2	Families and visitors will use a combination of sun protection measures (clothes, hat, glasses, creams, and shade) when they attend an outdoor event
Student habits	7.1	Students will use a combination of sun protective measures (clothes, hat, glasses, creams, and shade) when they are involved in outdoor activities

## Discussion

The *Soludable* accreditation program is the first acknowledgement of school sun protection to be developed in our country. This is a certification model that identifies those schools that actively encourage policies and practices of sun protection and involve the entire educational community.

The project was undertaken by a multidisciplinary group of experts including healthcare and educational professionals of national renown in coordination with the Health Promotion Service (Health Department), Service of Planning and Educational Programs (Education Department), and the Patient Safety Monitoring System of the Andalusian Agency for Health Quality.

In addition, the project was endorsed by the *Academia Española de Dermatología y Venereología* (Spanish Academy Dermatology and Venereology).

The structure of the model adopts the line of quality accreditation systems developed by the Andalusian Agency for Health Quality.<sup>17</sup> The recommendations included in the model are based on the policies of the Australian SunSmart School,<sup>15,16</sup> and are consistent with the educational plans and programs of healthy living habits of the Education Department of the Andalusian regional government<sup>18</sup> and also with the European health promotion guidelines, focused on creating environments that facilitate healthier lifestyles "Healthy cities in the twenty-first century" and "Health-promoting schools."<sup>19,20</sup>

The model for SunSmart School certification was implemented in Australia in 1993,<sup>21</sup> and has been greatly extended in the last 10 years. More than 90% of the Australian primary schools are registered with the SunSmart School program,<sup>22,23</sup> and these schools have shown better sun protection practices among students.<sup>24,25</sup> New Zealand adopted

**Table 2** Expert panel recommendations.

Domain	Item no. by domain	Recommendation	Aim	Assessment criterion
Organizational leadership	1.1	The school has written documentation of sun protection policies that covers the recommendations. The document is included in the plan for the school.	The school drafts sun protection documentation that covers the recommendations.	The school provides written documentation of recommendations of sun protection policies
	1.2	The school conducts diagnosis and audits of its shade	The coordinator of the sun protection policy drafts an annual report of the shady areas, as well as the technical characteristics of the structures used	The school has an audit report available
	1.3	The school and staff organize outdoor activities in shady areas or avoiding the midday sun (12h-16 h)	The school has an annual schedule of outdoor activities that records those that are conducted in shady areas or during the midday sun between April and September	At least 60% of the outdoor activities, performed by each group of students, are programmed in the shade or avoid the midday sun between April and September
	1.4	The school actively encourages the use of sun protection measures throughout the educational establishment	The school performs at least 1 activity per semester actively promoting the use of sun protection measures in the educational establishment	The school presents a report of these activities, including objective, methods, and assessment of results
	1.5	The school conducts continuous assessment of attitudes towards encouraging sun protection, shade, and the importance of these attitudes in the school curriculum	The coordinator of the sun protection program draws up an annual report that assesses compliance with sun protection policies in the school	The school submits an annual report that assesses compliance with the sun protection policies
Effective communication	2.1	The school informs the educational community about its sun protection policy	The school informs the entire educational community about its sun protection policy through its web page, brochure, and meetings aimed at students, families/tutors, and workers in the school.	The sun protection policies can be readily consulted through the webpage of the school; at the very least, a visible space will be included in a sign with a sun protection summary, and at least once every year, a meeting will be held about sun protection both with the student body, and with groups of families/tutors, and workers at the school

Table 2 (Continued)

Domain	Item no. by domain	Recommendation	Aim	Assessment criterion
	2.2	Communications with the educational community related with outdoor activities will include sun protection recommendations	In communications aimed at students, families/tutors, and staff who are involved in outdoor activities, recommendations about sun protection adapted to that particular activity will be included	In all communications aimed at students, families/tutors, and staff who are involved in outdoor activities, recommendations, whether in hardcopy or electronic format, about sun protection adapted to that particular activity
Structural elements	3.1	The schools have shady areas in outdoor recreational facilities	Guarantee shade to the educational community in outdoor activities performed in the school.	In the school, at least 25% of the surface area used for outdoor activities will have both natural and artificial shade with suitable lighting and ventilation. Artificial shade will be provided by systems that can be permanent, adjustable, or temporary during the months of April to September
	3.2	The school reports the local UV index daily to the school community	The school will report the local UV index daily to the school community	Daily, the maximum local UV index will be reported via hardcopy or electronic format using information provided by official web pages. This information will be visible in a strategic place in the school
Training of professionals	4.1	Sun protection is included in the teacher training program	Encourage official training for the staff	At least 50% of the teaching staff have taken official training in sun protection
School curriculum	5.1	Education about sun protection is included in the appropriate areas of the school curriculum	Include sun protection in the school curriculum	Program and develop at least 1 teaching unit or project related to sun protection in each educational cycle
Behavior models	6.1	The staff will lead by example, adopting a combination of sun protection measures	In the period between April and September, the staff make use of different sun protection measures: cap/hat, appropriate clothing, sunscreen, staying in the shade School staff transmit to the students the importance of their behavior	More than 80% of school staff use more than 2 measures of sun protection.
	6.2	Families and visitors will use a combination of sun protection measures when they attend an outdoor event or activity	Between April and September, whenever outdoor events take place with the attendance of family members or visitors, these will use sun protection measures: cap and appropriate clothing, sunscreen, or shade	More than 50% of attendees at these events use more than 2 measures of sun protection.

Table 2 (Continued)

Domain	Item no. by domain	Recommendation	Aim	Assessment criterion
Protection habits	7.1	In daily activities performed in a school, the students usually use school uniform (including for sports) that meets the basic aspects for sun protection, and shady areas are used during the breaks.	In the period from April to September, the summer uniforms include a shirt or t-shirt at least to the elbow and with a neckline above the shoulder blade, and trousers or skirts that cover at least to the knee. Sports clothing includes a shirt that covers the shoulders and neck above the shoulder blade, and includes trousers or skirt that cover at least half the thigh. All students, in activities performed in the school playground, should wear a hat that protects the face, neck, and ears (legionnaire hat, wide-brimmed hat, or sun hat) when they are outside. In physical education classes, baseball caps may be used if the alternatives are not practical. Approved adjustable glasses will be used (category 2, 3, or 4, CE certified) that cover most of the ocular surface. Broad spectrum, water resistant, sunscreens above factor 30 will be applied before going outside for the break. Students will remain in shady areas at times of maximum radiation	More than 80% of children use more than 2 measures of sun protection

**Table 3** First Delphi round assessment of the importance and feasibility of the recommendations.

Domain	Item no. by domain	Recommendation	Importance	Feasibility	Total score
Organizational leadership	1.1	The school has written documentation of sun protection policies that covers the recommendations. The document is included in the plan for the school.	5	5	10
	1.2	The school conducts diagnosis and audits of its shade	5	5	10
	1.3	The school and staff organize outdoor activities in shady areas or avoiding the midday sun (12h-16 h)	5	3	8
	1.4	The school actively encourages the use of sun protection measures throughout the educational establishment	4	3	7
	1.5	The school conducts continuous assessment of attitudes towards encouraging sun protection, shade, and the importance of these attitudes in the school curriculum	5	4	9
Effective communication	2.1	The school informs the educational community about its sun protection policy	5	5	10
	2.2	Communications with the educational community related with outdoor activities will include sun protection recommendations	5	5	10
Structural elements	3.1	The schools have shady areas in outdoor recreational facilities	5	3	8
	3.2	The school reports the local UV index daily to the school community	4	4	8
Training of professionals	4.1	Sun protection is included in the teacher training program	5	3	8
School curriculum	5.1	Education about sun protection is included in the appropriate areas of the student curriculum	5	4	9
Behavior models	6.1	The staff lead by example, adopting a combination of sun protection measures	5	4	9
	6.2	Families and visitors will use a combination of sun protection measures when they attend an outdoor event or activity	4	3	7
Protection habits	7.1	In daily activities performed in a school, the students usually use school uniform (including for sports) that meets the basic aspects for sun protection, and shady areas are used during the breaks.	5	3	8



**Table 4** Second Delphi Round Assessment of Strength of the Recommendations.

Domain	Item no. by domain	Recommendation	Level of agreement among panel members, %
Organizational leadership	1.1	The school has written documentation of sun protection policies that covers the recommendations. The document is included in the plan for the school.	(89 I-11 I)
	1.2	The school conducts diagnosis and audits of its shade	(89 I-11 I)
	1.3	The school and staff organize outdoor activities in shady areas or avoiding the midday sun (12h-16 h)	(32 I-68 II)
	1.4	The school actively encourages the use of sun protection measures throughout the educational establishment	(21 I-79 II)
	1.5	The school conducts continuous assessment of attitudes towards encouraging sun protection, shade, and the importance of these attitudes in the school curriculum	(89 I-11 I)
Effective communication	2.1	The school informs the educational community about its sun protection policy	(89 I-11 I)
	2.2	Communications with the educational community related with outdoor activities will include sun protection recommendations	(79 I-21 I)
Structural elements	3.1	The schools have shady areas in outdoor recreational facilities	(21 I-79 II)
	3.2	The school reports the local UV index daily to the school community	(47 I-53 II)
Training of professionals	4.1	Sun protection is included in the teacher training program	(0 I-100 II)
School curriculum	5.1	Education about sun protection is included in the appropriate areas of the school curriculum	(68 I-32 I)
Behavior models	6.1	The staff lead by example, adopting a combination of sun protection measures	(89 I-11 I)
	6.2	Families and visitors will use a combination of sun protection measures when they attend an outdoor event or activity	(32 I-68 II)
Protection habits	7.1	In daily activities performed in a school, the students usually use school uniform (including for sports) that meets the basic aspects for sun protection, and shady areas are used during the breaks.	(21 I-79 II)

the SunSmart School program in 2005 and a notable improvement in sun protection policies and practices have been observed between 2005 and 2009 in primary schools.<sup>26,27</sup> Furthermore, the introduction of education in matters of sun protection in schools is not only associated with better practices within the school itself, but it also seems to improve sun protection habits outside the school environment.<sup>28,29</sup>

In a range a studies conducted in primary school and secondary school populations in Andalusia, high rates of sunburn have been reported (between 54% and 74%).<sup>30-32</sup> In this same risk population, an improvement has also been demonstrated in sun protection awareness and behavior in teenagers after an Internet-based educational intervention.<sup>33</sup> The introduction of this accreditation system, whose intention is to encourage good sun protection behavior among school children, will alleviate cancer risk in

the coming years, as schools start to adhere to the strategy of the *Soludable* accreditation system.

Setting up these measures may be difficult, as it requires commitment from education professionals, head teachers, and government organizations should structural changes be necessary. To assist the schools in obtaining accreditation, we have drawn up a manual for certification and an easily navigated online self-assessment tool in the Andalusian Agency for Health Quality for each of the domains. This would enable schools to identify their position within the accreditation system, determine what they want to achieve, and plan their actions accordingly, with consensus and shared goals. This would be complemented with the progressive nature of the accreditation system. This process is understood to be dynamic, continuous, and evolving, and would reflect the potential for improving quality.

Currently, we do not have information on the sun protection measures that are used in Spanish schools. We therefore need new studies to determine the current prevalence of sun protection practices and policies in schools. The presentation of this accreditation system in schools would enable assessment of the number of schools interested in requesting the certification model, as well as the impact this has on the school itself; it would also enable assessment of the main barriers and opportunities for implementation, and evaluation of the changes made after implementation.

In conclusion, we have presented a school certification model that enables identification of schools that actively encourage sun protection by introducing a set of measures or good practices that are objective and evaluable. This is the first school accreditation system for sun protection to be developed in Spain. It can be expected that, in the coming years, adherence of schools, whether primary or secondary, to this strategy will contribute to reducing the incidence of sunburn in school children, although long-term studies are needed to determine the uptake and health and economic impact of this initiative without precedent in Spain.

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## Conflicts of interest

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