

**OPIICS 2019****International Conference of Psychology, Sociology, Education, and Social Sciences****BENEFITS AND DAMAGES OF THE SUN ON HEALTH: A  
SPANISH CHILDREN'S PERSPECTIVE**

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***Abstract***

The habits and knowledge that children have about sun protection have been widely studied. However, none of these studies have focused on the child's knowledge about the beneficial health effects of exposure to the sun. Our aim was to ascertain the knowledge and beliefs of children about the beneficial and harmful effects of the sun. A prospective observational study was conducted in 4 randomly chosen schools in Zaragoza (Spain). Students from 9 to 12 years old were surveyed using the “draw and write” technique. Children made two drawings: one of “a person who had sunbathed too much” and the other representing “the sun's benefits on health”. 410 students participated in the study, and 403 were included in the analysis, 50.6% boys. The most represented beneficial effects of the sun were the environmental ones (26.05%) followed by the feeling of well-being (16.13%). Tan appearance was considered a beneficial effect by 10,95% of the children. 83.62% recognized sunburn as the most relevant consequence of too much exposure to the sun. As conclusion, the children know well not only the sun's damaging effects on health, focused almost exclusively on sunburn, but also its beneficial effects, primarily perceived as environmental. The “Draw-and-Write” technique it is a qualitative method depending somewhat on the interpretation on the words and drawings of children by adults.

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## 1. Introduction

“When I was their age, I could draw like Rafael, but it took me a lifetime to learn to draw like them”.

Pablo Picasso, in a visit to an exhibition of children's drawings

Sunlight is essential for life on earth. However, excessive exposure causes skin cancer and other adverse health effects. In this context skin protection of children is of particular relevance since children spend a lot of time outdoors and sunburn reactions in childhood are particularly important in the development of melanoma (Berneburg & Surber, 2009).

Sun protection educational programs in primary schools have been shown to promote improvement in knowledge, intentions to play in the shade and to use sunscreen, and attitudes regarding healthiness of a tan (Balk, 2011; Gilaberte, Alonso, Teruel, Granizo, & Gállego, 2008; Saraiya et al., 2004; Townsend et al., 2011).

The study of children's drawings has proved to be very useful in the investigation of different aspects of children's health, since such drawings are much more expressive and illustrative than are their oral or written descriptions (Guariso et al., 1999; Horstman & Bradding, 2002; Stafstrom, Goldenholz, & Dulli, 2005). Indeed, drawing is a favored medium of expression for children, and an excellent instrument to communicate their experiences and attitudes. Our group has already used children's drawings to investigate their knowledge, attitudes and practices about sun safety (Gilaberte et al., 2008).

## 2. Problem Statement

During the last decade, the quantity of research aimed at analyzing the knowledge and habits that children have about photoprotection has increased. Most of the studies are based on questionnaires that ask children about their knowledge of the damaging effects of the sun on the skin (Buendía-Eisman, Feriche-Fernández, Muñoz-Negro, Cabrera-León, & Serrano-Ortega, 2007; Esteve et al., 2003). However, no study has focused on the analysis of children's knowledge about the beneficial health effects of exposure to the sun.

## 3. Research Questions

This is a prospective observational study, made with students aged from 9 to 12 years old in the fifth and sixth year of Primary Education attending four different schools in Zaragoza (Spain). The schools were chosen randomly. The reason why we chose this age range was because it includes students in the last year of Primary Education, immediately before going to high school. The data were collected in May 2016. The 30-minutes test was performed in the school setting, in the presence of the researcher.

The “Draw-and-Write technique” provides information about what children do to protect themselves from the sun, without giving the children specific information about the topic of the survey or the benefits and damages of the sun on human beings (Pion et al., 1997). The children received two invitations to take part in the “Draw-and-Write” investigation: in the first one, they were asked to draw and write about “a person who had sunbathed too much”; in the second one, the student had to represent “the health benefits

of the sun”. According to the recommendations made by Horstman, Aldiss, Richardson, and Gibson (2008), we analyzed whether the children either drew, or wrote about, the following four categories: 1) represented characters: children, boys or girls, and adults, mother or father; 2) contexts: different situations where they could get sunburnt (either accidentally while playing sport or intentionally by sunbathing); 3) cultural dimension: the phenomenon of being tanned as something attractive; 4) knowledge about the sun’s beneficial effects on health. Drawings deemed “non-understandable” were not considered for evaluation.

### **3.1. Ethics**

The study was undertaken with the approval of each school's parents and teacher’s commission. None of the data from the study have been previously published or presented.

### **3.2. Results**

Results were expressed as frequencies, except for the age, which was expressed as average values. A statistical analysis, consisting of difference in proportions, was performed.

## **4. Purpose of the Study**

The objective of this study was to ascertain children’s knowledge about the benefits and damages of the sun on human beings.

## **5. Research Methods**

410 students participated in the study during May 2016, all of them from 9 to 12 years old (the average age was 10.4). The number of students whose drawings could be evaluated was 403, of which 204 were males and 199 females. 806 drawings were analyzed, all of them representing the same topic: the effects of the sun on people.

## **6. Findings**

The represented beneficial effects of the sun are summarized in Table 1. The most frequently represented benefits were the environmental ones (26.05%), followed by the feeling of well-being (16.13%).

Obtaining energy or light and heat is represented by 22.85%. The direct effects on health, growth, bones or vitamin D was drawn by 70 children (17.38%). 13.90% considered suntan as one of the sun’s beneficial effect on health, a percentage that increases to 19.11% if we include those who combine being tanned with being strong as another beneficial effect of the sun.

Boys seemed more likely than girls to represent the beneficial effects of the sun (Table 1).

**Table 01.** Summary of beneficial effects of the sun represented by the students

BENEFICIAL EFFECTS	BOYS		GIRLS		TOTAL
	N=204 (%)		N=199 (%)		(N=403) %
Environmental/Ecological	68	(33.33%)	37	(18.59%)	
Solar power/energy	28	(13.73%)	15	(7.53%)	196 (48.64%)
Light and heat	28	(13.73%)	20	(10.05%)	
Well-being	39	(19.12%)	26	(13.07%)	
Growth	16	(7.84%)	8	(4.02%)	148 (36.72%)
Vitamin D	18	(8.82%)	6	(3.02%)	
Bones	13	(6.37%)	9	(4.52%)	
Strength	8	(3.92%)	5	(2.51%)	
Being strong and tanned	18	(8.82%)	3	(1.51%)	77 (19.11%)
Being tanned	32	(15.68%)	24	(12.06%)	
Other	4	(1.96%)	46	(23.12%)	50 (12.41%)

In response to the first invitation to draw a person who had sunbathed too much, most children (83.62%) drew a person suffering from sunburn. Most students tend to draw children of their own gender (52.10%). Only 4.08% of children (n=19), mostly boys, drew someone playing sports. 73 children (14.52%) drew an adult with sunburn, and both boys and girls drew a male. 32.66% of girls represented other harmful effects such as heat stroke or skin cancer.

## 7. Conclusion

This study provides a novel approach to learning about children’s views concerning the sun. The benefits of the sun are primarily perceived as either environmental or aesthetic (being tanned), whereas sun’s damaging effects focused almost exclusively on sunburn.

It is remarkable that when children are asked about the beneficial effects of the sun on health, they put the environment first. A possible explanation of this fact is that environmental education is a topic included in the curricular design of the LOGSE (the Education Law in force in Spain between 1990 and 2006) since nursery school. Moreover, children see illness as something far-off and they do not consider the sun as a source of health as a priority. However, they perceive that the sun provides a feeling of wellbeing, and some of them express the effect on bones and vitamin D, the most well-known effect of this vitamin (Winzenberg & Jones, 2013), fundamental for children and included in their textbooks.

On the other hand, it is worrying that around 20% of students represent tanning as a beneficial effect of the sun on health, a higher proportion of boys than girls. Our results agree with those published by Laffargue, Merediz, Buján, and Pierini (2011), that males most frequently are inclined to believe that a good suntan was synonymous of health and women believed that suntan was synonymous of beauty. Although standards of beauty are changing, suntan is still considered attractive. In fact, among adolescents, between 10.8 and 28% used sunless tanning products, 14% indoor tanning and 42 % wanted to be tanned (Cokkinides, Bandi, Weinstock, & Ward, 2010; Gordon & Guenther, 2009).

The fact that sunburn was the most frequently represented adverse effect of the sun is not surprising since it is the most often experienced by children. Sunburn was almost the only adverse effect represented by boys, whereas girls seem to have a better knowledge of other harmful effects of the sun on health, such

as skin cancer or heat stroke. It has been reported that children and their parents are inadequately sun protected while practicing sports outdoors (Mahé et al., 2011). Nevertheless, in our sample less than 10% of sunburn occurred while practicing sports.

The fact that children mainly drew figures of their own gender suggests that they are probably representing themselves and their own experiences. Only a few children drew sunburned adults, most frequently males. This may be the father figure who generally applies less sun lotion and makes more sporadic and intensive exposures (Gilaberte et al., 2001).

As conclusions, the “Draw-and-Write” technique may be a limitation of the study as it is a qualitative method depending somewhat on the interpretation on the words and drawings of children by adults. However there are three reasons to support the validity of this study: 1) its popularity among health education professionals working with children, where the technique has been generally employed in the classroom (Backett-Milburn & McKie, 1999); 2) this form of test has been successfully used with children to study their knowledge of, and behavior regarding the sun (Gilaberte et al., 2008; McWhirter, Collins, Bryant, Wetton, & Newton, 2000; Pion et al., 1997; Rademaker, Wyllie, Collins, & Wetton, 1996).

For the future, educational programs to prevent skin cancer must continue, showing not only the damaging effects of the sun but also its benefits on health. Furthermore, major efforts are needed to change the attitudes of both children and adolescents in equating a suntan with personal qualities such as strength, health and beauty.

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## References

- Backett-Milburn, K., & McKie, L. (1999). A critical appraisal of the draw and write technique. *Health Education Research, 14*, 387-98.
- Balk, S. J. (2011). Ultraviolet radiation: a hazard to children and adolescents. *Pediatrics, 127*(3), e791-e817.
- Berneburg, M., & Surber, C. (2009). Children and sun protection. *British Journal Dermatology, 161*(3), 33-9.
- Buendía-Eisman, A., Feriche-Fernández, E., Muñoz-Negro, J. E., Cabrera-León, A., & Serrano-Ortega, S. (2007). Evaluation of a school intervention program to modify sun exposure behavior. *Actas Dermosifiliograficas, 98*, 332-44.
- Cokkinides, V. E., Bandi, P., Weinstock, M. A., & Ward, E. (2010). Use of sunless tanning products among US adolescents aged 11 to 18 years. *Archives Dermatology, 146*, 987-992.
- Esteve, E., Armingaud, P., Baranger, J. M., Bellier, N., Darchy, M., Delavierre, C., & Leblanc, C. (2003). "Sunshine at school": a network for training on sun exposure. Assessment of knowledge among 683 children. *Annals Dermatology Venereology, 130*, 171-176.
- Gilaberte, Y., Agualeles, M. J., Coscojuela, C., Doste, D., Fajó, J., & Teruel, M. P. (2001). Predictors of sun protection in children: a parent's survey. *Actas Dermosifiliograficas, 92*, 81-7.

- Gilaberte, Y., Alonso, J. P., Teruel, M. P., Granizo, C., & Gállego, J. (2008). Evaluation of a health promotion intervention for skin cancer prevention in Spain: the SolSano program. *Health Promotion International*, 23, 209-219.
- Gordon, D., & Guenther, L. (2009). Tanning behavior of London-area youth; *Journal Cutaneous Medicine Surgery*, 13, 22-32.
- Guariso, G., Mozrzymas, R., Gobber, D., Benini, F., Zancan, L., & Zacchello, F. (1999). Self-report assessment of recurrent abdominal pain. *Pediatria Medica Chirurgica*, 21, 255-260.
- Horstman, M., & Bradding, A. (2002). Helping children speak up in the health service. *European Journal Oncology Nursing*, 6, 75-84.
- Horstman, M., Aldiss, S., Richardson, A., & Gibson, F. (2008). Methodological issues when using the draw and write technique with children aged 6 to 12 years. *Qualitative Health Research*, 18, 1001-1011.
- Laffargue, J. A., Merediz, J., Buján, M. M., & Pierini, A. M. (2011). Sun protection questionnaire in Buenos Aires adolescent athletes. *Archivos Argentinos Pediatría*, 109, 30-35.
- Mahé, E., Beauchet, A., de Paula Corrêa, M., Godin-Beekmann, S., Haeffelin, M., Bruant, S., ... & Aegerter, P. (2011). Outdoor sports and risk of ultraviolet radiation-related skin lesions in children: evaluation of risks and prevention. *British Journal Dermatology*, 165, 360-7.
- McWhirter, J. M., Collins, M., Bryant, I., Wetton, N. M., & Newton, J. (2000). Evaluating 'Safe in the Sun', a curriculum programme for primary schools; *Health Education Research*, 15, 203-217.
- Pion, I. A., Kopf, A. W., Hughes, B. R., Wetton, N. M., Collins, M., & Newton, J. A. (1997). Teaching children about skin cancer: the draw-and-write technique as an evaluation tool. *Pediatric Dermatology* 14, 6-12.
- Rademaker, M., Wyllie, K., Collins, M., & Wetton, N. (1996). Primary school children's perceptions of the effects of sun on skin. *Australasian Journal Dermatology*, 37, 30-36.
- Saraiya, M., Hall, H. I., Thompson, T., Hartman, A., Glanz, K., Rimer, B., & Rose, D. (2004). Skin cancer screening among U.S. adults from 1992, 1998, and 2000 National Health Interview Surveys; *Preventive Medicine*, 39, 308-314.
- Stafstrom, C. E., Goldenholz, S. R., & Dulli, D. A. (2005). Serial headache drawings by children with migraine: correlation with clinical headache status. *Journal Child Neurology*, 20, 809-13.
- Townsend, J. S., Pinkerton, B., McKenna, S. A., Higgins, S. M., Tai, E., Steele, C. B., ... & Brown, C. (2011). Targeting children through school-based education and policy strategies: comprehensive cancer control activities in melanoma prevention. *Journal American Academy Dermatology*, 65, S104-113
- Winzenberg, T., & Jones, G. (2013). Vitamin D and bone health in childhood and adolescence, *Calcified Tissue International*, 92, 140-150.