Original Article

Parents' Knowledge about Sun Exposure and a Comparison of their Personal Practices versus Those Used to Protect their Children against the Sun

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Abstract

Objectives: Overexposure to the sun during childhood is a well-known risk factor for skin cancer. Childhood is a crucial period for establishing and continuing to develop healthy sun protection behaviors. The purpose of our study was to investigate parents' knowledge and compare their personal behaviors in regard to sun protection for themselves and for their children. **Materials and Methods**: We conducted a cross-sectional population-based study. A questionnaire was given to 738 parents, 700 of whom completed the questionnaire and were included in the study. **Results:** Among the 700 parents, 88% (n = 616) were female and 12% (n = 84) were male. The mean age of the parents and children was 35.1 ± 5.6 years and 5.2 ± 3.0 years, respectively. Eighty-three percent (n = 580) of the parents were aware of sun exposure during childhood as a risk factor for skin cancer, but approximately only 15% of the parents reported using sunscreen regularly for themselves and for their children. Fifty-two percent (n = 367) of the parents implied not using any protective clothing for their children. **Conclusion:** Our study showed that parents were aware of the risks of sun exposure and the need for sun protection for themselves and children, but protective practices were low overall. Parents should be included in educational interventions targeting sun protection behaviors toward themselves and their children.

Keywords: Child, dermatology, parent, sun protection

Introduction

It is well known that the most important factor in the etiology of melanoma is ultraviolet (UV) radiation, mainly in childhood.[1] In 2008, more than 20,000 deaths due to melanoma were reported in Europe, and 35.5% of these were from the middle and eastern parts of Europe.[2] Turkey is in the eastern part of Europe, populated by Caucasians, primarily with Fitzpatrick skin types III and IV. In 2017, Baykal *et al*. reported that lentigo maligna melanoma, in which cumulative sun exposure plays a major role in the etiology, was higher in Turkey than in other European countries.[3] The harmful effects of UV rays have relatively increased because of vacation and tanning habits and thinning in the ozone layer. In recent years, tanning seems to have become fashionable and desirable among the people, especially in adolescents.[4]

Previous studies have shown that intermittent or intense sun exposure is a major determinant in the development of melanoma in adult life.[5] Hence, avoidance from sunburn and acquiring healthy habits regarding the sun in childhood is very important, especially in sunny countries such as Turkey. In this context, parental practices in terms of sun protection are of crucial importance for both themselves and their children and also for developing a positive approach regarding these behaviors.[6]

We conducted this study to assess parental beliefs about the harmful effects of UV radiation and compare the sun

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protection behaviors that parents used for themselves and their children.

Materials and Methods

A cross-sectional population-based study was conducted between February 2017 and September 2018 in two tertiary hospital settings in Istanbul among parents with a child aged under 10 years. Participants were excluded if their questionnaires were incomplete or their children had diseases that could affect outdoor activities or sun protection behaviors (e.g., cerebral palsy, severe heart disease, severe asthma, and photosensitive disorders such as xeroderma pigmentosum). Seven hundred and thirty-eight parents gave consent for participation and 700 completed the survey. The study was approved by the ethics committee (No: 1946). A semi-structured questionnaire was developed by the authors, which included items on demographics, knowledge about sun exposure, skin cancer awareness, and questioned the practices of the parents in terms of protecting children against the sun.

Demographic characteristics

Demographic characteristics of parents and children were recorded. The children were divided into two groups: lighter (Fitzpatrick phototype [FP] I–III) and darker skinned (FP IV–VI) based on the parents' statements about their children's FP. The FP is a standard scale based on an individual's tanning characteristics and it correlates well with phenotypic skin color, ranging from I (always burns) to VI (never burns).

Sun protection knowledge

In the second part, questions about sun safety knowledge were answered on a 4-point Likert scale (never, rarely, sometimes, and always) in five categories: sunscreen use, hat use, sunglasses use, wearing long-sleeve clothing, and seeking shade. Furthermore, parents' beliefs were assessed about sun protection (response categories were "yes, no, and do not know") such as tanned skin is healthy, tanned skin does not need sun protection, and individuals who only go into the sun for 1–2 weeks a year are not at risk for skin cancer, and number of nevi and frequency of sunburns during childhood are important for skin cancer development.

Practices in children's sun protection

In the third part of the questionnaire, a 4-point Likert scale about sun protection behaviors – using sunscreen, wearing a hat, sunglasses, and long-sleeve clothing, and seeking shade – were answered by parents for their children. Furthermore, beliefs about children's sun protection were questioned with true/false/don't know answers such as if the child was in water, was it still necessary to apply sunscreen, and was it acceptable for a child to stay outside when sunscreen had been applied? The total number of times a child had had sunburn during the child's life was also recorded.

Data analysis

Descriptive statistics are given as number and percentage for categorical variables and average and standard deviation for numeric variables. Comparisons between the two dependent groups were made using the McNemar–Bowker test, and categorical variables were compared using the Chi-square test. The bivariate associations between parental knowledge and practices of sun protection were assessed using the Mantel–Haenszel Chi-square test.

Results

Parents and children's sociodemographic factors

The study included 700 parents, of which 88% (n = 616) were female and 12% (n = 84) were male. The mean age of the parents and children was 35.1 ± 5.6 years and 5.2 ± 3.0, respectively. Among the parents, 21% (n = 151) had graduated from primary school, 24% (n = 171) had graduated from high school, and 54% (n = 378) were university graduates. One hundred and twenty-six (18%) children had lighter skin and 574 (82%) had darker skin according to the FP. According to the parents' responses, most of the children (82%, n = 574) had no history of sunburn. Seventy-four (10.6%) children had a history of one sunburn, 24 (3.4%) children had been burned twice, 19 (2.7%) children had been burned three times, and 9 (1.2%) children had a history of more than three sunburns.

Parental knowledge about sun safety and skin cancer

A high level of knowledge (82.9%) concerning "skin cancer risk-related sunburns during childhood" and "preference of very high-sun protection factor (SPF) sunscreens for their children" (82.3%) was observed. However, 59.3% of the parents believed that individuals who only went into the sun for 1–2 weeks a year were not at risk for skin cancer and almost 40% believed that "tanned skin did not need sun protection" [Table 1]. Among the women, 82% (n = 507) and 68.3% (n = 100) of men were aware of the causal relationship between sunburn during childhood and skin cancer (P = 0.003).

Comparison of the parents' sun protection behaviors and practices in their children's protection

The sun protection behaviors of the parents and practices for their children's protection are shown in Table 2. Fifteen percent of the parents implied using sunscreen regularly for themselves and for their children. Hats were more frequently worn by children, and sunglasses were more frequently worn by parents. Regular using of long-sleeved clothing on sunny days was very low (~2% in both the groups). In bivariate analyses [Table 3], the association between parental behaviors and practices for their children corroborated that parental behaviors were associated with the sun protection practices for their children. Parents who had lighter-skinned children were more likely to use sunscreen regularly (27%) than parents of darker-skinned children (13%) [Table 4]. Only 1% of the parents who graduated from primary school regularly used sunscreen for their children, whereas 24% of the university graduates regularly applied sunscreen to their children. The number of parents who "always sought shade on sunny days" was similar in all the groups, 23% for primary school graduates, 25% for high school graduates, and 26% for

university graduates. We found that 32% of the parents did not use protective clothing for themselves and 52% of the parents failed to use it for their children [Table 5].

Discussion

Protection against UV radiation of the sun is a fundamental rule in the primary prevention of melanoma and other skin cancers. The increasing incidence of melanoma worldwide indicates the need for awareness of sun protection behaviors.[7] Evidence suggests that sun protection behavior in Turkey is still inadequate, despite the sunny period in Istanbul averaging 5.55 h daily, more than in most European cities. Cınar *et al*. reported that 47% of people had sunburn at least once[8] and in the past year, and Balcı *et al.* conducted a survey with 1634 individuals and found that the rate of using sunscreen was only 40%.[9] Ilter *et al*. conducted a cross-sectional study with 764 individuals between 2005 and 2006 and reported that 44% of participants did not use sunscreens. Hats and umbrellas (40%) were the most common accessories used for sun protection.[10] Terzi *et al*. reported that 69% of patients had satisfactory knowledge about sun protection.[11] Our results were similar with high percentages of correct answers in knowledge questions; however, 60% of individuals believed that 1–2 weeks' sun exposure per year was not a risk for skin cancer.

Childhood is an especially important period for protection against UV rays.[12] Studies showed that sun exposure during early life was a strong future risk factor for melanoma.[13] Moreover, unlike adults, children spend most of their time in the open air. It has been estimated that approximately half of cumulative UV radiation exposure occurs before the age of 20 years.[14] Young children are unable to adopt sun-protective practices independently, and they are dependent on their parents or caregivers to provide sun protection. Sun protection behaviors in adolescents are more difficult to change due to significant peer influences; tanning is thought to be fashionable among teenagers.[15] Therefore, targeting children regarding modifiable approaches for sun protection may be more achievable, and sun behaviors established during childhood are often seen to endure into adulthood.[16] Baz *et al*.[17] conducted a survey with Turkish parents, and it was reported that 88% of participants tried to protect their children from the sunlight, whereas 11.2% did not. Later, Kaptanoğlu *et al*. revealed that 33% of families reported a lack of application of sun protection measures.[18] In agreement with the results of other studies, we found that 95% of the parents tried to protect their children from the sun.

In the United Kingdom (UK), a study was conducted on 1000 parents with children aged 11 years and under, which revealed that 7% of participants admitted had never applied sunscreen to their children and 40% of children had experienced sunburn in the past 2 years.[19] In Turkey in 2003, Baz *et al*. reported that 65% of children had a history of sunburn according to their parents' statements.[17] We found that 82% of the children had no history of sunburn. This difference may

Table 1: Parents' knowledge about harmful effects of sun (*n*=700)

	Correct answers	
	n (%)	95% CI (minimum-maximum)
Higher number of nevi is a risk factor for skin cancer	503 (71.9)	68.42-75.06
Tanned skin is healthy	565 (80.7)	77.62-83.46
Tanned skin does not need sun protection	422 (60.3)	56.62-63.85
Individuals who only go into the sun for 1-2 weeks a year are not at risk for skin cancer	285 (40.7)	37.13-44.39
Frequency of sunburns during childhood increases risk of skin cancer	580 (82.9)	79.89-85.47
It is ok if a child stays out in the sun when sunscreen is applied	451 (64.4)	60.81-67.89
Very high SPF (>50) sunscreens should be used in children	576 (82.3)	79.29-84.94
If the child is in water, it is still necessary to apply sunscreen	485 (69.3)	65.78-72.59

SPF: Sun protection factor, CI: Confidence interval

Table 2: Comparison of sun protection practices of parents and those used for their children

	Sunscreen, *n* (%)	Hats, *n* (%)	Shade, *n* (%)	Sunglasses, *n* (%)	Clothing, *n* (%)
Parents themselves					
Never	201 (28.7)	177 (25.3)	37 (5.3)	72 (4.5)	226 (32.2)
Rarely	244 (34.9)	293 (41.9)	209 (29.9)	158 (22.5)	235 (33.5)
Sometimes	148 (21.1)	125 (17.9)	348 (49.7)	192 (27.4)	183 (26.1)
Always	107 (15.3)	105 (15.0)	106 (15.1)	278 (39.7)	16 (2.2)
For their children					
Never	176 (25.1)	43 (6.1)	32 (4.6)	208 (29.7)	367 (52.4)
Rarely	233 (33.3)	226 (32.3)	195 (27.9)	291 (41.6)	269 (38.4)
Sometimes	182 (26.0)	235 (33.6)	293 (41.9)	129 (18.4)	46 (6.6)
Always	109 (15.6)	196 (28.0)	180 (25.7)	72 (10.3)	18 (2.6)

Table 3: The bivariate association of parents' personal behaviors regarding sun protection and practices for their children

	Never, *n* (%)	Rarely, *n* (%)	Sometimes, *n* (%)	Always, *n* (%)	*P*
Frequency of sunscreen use on sunny days					
Frequency of sunscreen use on sunny days to their children					
Never	139 (69.2)	26 (10.7)	4 (2.7)	7 (6.5)	<0.001
Rarely	48 (23.9)	157 (64.3)	19 (12.8)	9 (8.4)	
Sometimes	10 (5.0)	50 (20.5)	86 (58.1)	36 (33.6)	
Always	4 (2.0)	11 (4.5)	39 (26.4)	55 (51.4)	
Frequency of putting a hat on a child on sunny days					
Frequency of putting a hat to their children on sunny days					
Never	33 (9)	0 (1)	176 (33)	9 (0)	<0.001
Rarely	56 (146)	15 (9)	233 (56)	146 (15)	
Sometimes	58 (87)	74 (16)	182 (58)	87 (74)	
Always	30 (51)	36 (79)	109 (30)	51 (36)	
Frequency of staying in the shade on sunny days					
Frequency of keeping the child in the shade on sunny days					
Never	22 (7)	1 (2)	22 (7)	1 (2)	<0.001
Rarely	11 (122)	56 (6)	11 (122)	56 (6)	
Sometimes	1 (58)	206 (28)	1 (58)	206 (28)	
Always	3 (22)	85 (70)	3 (22)	85 (70)	

Table 4: Parental sun protection practices for their children according to Fitzpatrick phototype skin types

	Darker skinned (FP I-III), *n* (%)	Lighter skinned (FP IV-VI), *n* (%)	*P*
Sunscreen			
Never	142 (24.7)	34 (27.0)	<0.001
Rarely	206 (35.9)	27 (21.4)	
Sometimes	151 (26.3)	31 (24.6)	
Always	75 (13.1)	34 (27.0)	
Clothing			
Never	306 (53.3)	61 (48.4)	0.286
Rarely	220 (38.3)	49 (38.9)	
Sometimes	36 (6.3)	10 (7.9)	
Always	12 (2.1)	6 (4.8)	
Hat			
Never	34 (5.9)	9 (7.1)	0.021
Rarely	200 (34.8)	26 (20.6)	
Sometimes	187 (32.6)	48 (38.1)	
Always	153 (26.7)	43 (34.1)	
Shade			
Never	29 (5.1)	3 (2.4)	0.479
Rarely	160 (27.9)	35 (27.8)	
Sometimes	242 (42.2)	51 (40.5)	
Always	143 (24.9)	37 (29.4)	
Sunglasses			
Never	166 (28.9)	42 (33.3)	0.022
Rarely	253 (44.1)	38 (30.2)	
Sometimes	102 (17.8)	27 (21.4)	
Always	53 (9.2)	19 (15.1)	

FP: Fitzpatrick phototype

be attributed to the increased awareness of the harmful effects of the sun in childhood. The implementation of public health campaigns about melanoma and sun protection throughout the past 15 years has generated widespread sun protection awareness. Furthermore, we included parents with children aged younger than 10 years because parents have less control over their children in adolescent ages, whereas Baz *et al*. included all age groups. Moreover, in the UK, children are lighter skinned than in Turkey, which could lead to more frequent sunburn.

Baykal Selcuk *et al*. conducted a survey in Turkey among 17,769 participants and found that sunscreen use was the most preferred sun protection method.[20] Similarly, we found that 71% of the parents used sunscreen for themselves and 75% used it for their children to some degree. Furthermore, 28% of the parents always made their children wear hats, but only 15% wore hats themselves. In line with this, a study showed that parents were more likely to practice skin cancer prevention for their children than for themselves.[21] In another study, authors implied that family-based interventions would be a more efficacious strategy to increase sun protection behaviors.[22] In a recent study, authors showed that "parental permission to tan" and "parental behaviors toward tanning" were strong predictors for indoor tanning in adolescents.[23] In our study, there was poor adoption of protective clothing. Wearing long-sleeved clothing was associated with reduced number of nevi; however, the use of sunscreen, although preventing sunburn, may lead to increased overall sun exposure in children.[24] Educational programs should emphasize the importance of the use of sunscreens and wearing protective clothing. McMichael *et al*. claimed that the majority of participants in their study stated that they would consider umbrella use if recommended by a dermatologist.[25]

Tan *et al*. showed that most parents of darker-skinned children expressed a lack of concern regarding the need for routine sun protection for their children.[26] Our study results support these

Table 5: Education levels of parents and sun protection practices for their children

	Primary school, *n* (%)	High school, *n* (%)	University, *n* (%)	*P*
Sunscreen				
Never	72 (47.7)	56 (32.7)	48 (12.7)	<0.001
Rarely	65 (43.0)	71 (41.5)	97 (25.7)	
Sometimes	12 (7.9)	30 (17.5)	140 (37.0)	
Always	2 (1.3)	14 (8.2)	93 (24.6)	
Clothing				
Never	73 (48.3)	92 (53.8)	202 (53.4)	0.342
Rarely	68 (45.0)	64 (37.4)	137 (36.2)	
Sometimes	5 (3.3)	11 (6.4)	30 (7.9)	
Always	5 (3.3)	4 (2.3)	9 (2.4)	
Hat				
Never	13 (8.6)	15 (8.8)	15 (4.0)	<0.001
Rarely	70 (46.4)	64 (37.4)	92 (24.3)	
Sometimes	38 (25.2)	39 (22.8)	158 (41.8)	
Always	30 (19.9)	53 (31.0)	113 (29.9)	
Shade				
Never	17 (11.3)	9 (5.3)	6 (1.6)	<0.001
Rarely	57 (37.7)	52 (30.4)	86 (22.8)	
Sometimes	42 (27.8)	66 (38.6)	185 (48.9)	
Always	35 (23.2)	44 (25.7)	101 (26.7)	
Sunglasses				
Never	56 (37.1)	57 (33.3)	95 (25.1)	<0.001
Rarely	71 (47.0)	69 (40.4)	151 (39.9)	
Sometimes	14 (9.3)	19 (11.1)	96 (25.4)	
Always	10 (6.6)	26 (15.2)	36 (9.5)	

findings. Other sun protection measures except sunscreen use were similar between dark-skinned and light-skinned children, which could indicate that parents may not be aware of other sunscreen methods or their importance. Not surprisingly, we found that university graduates reported more regular use of sunscreens.

Our study limitations were the high educational level of the parents, representative for a narrow geographic distribution. The questionnaire was prepared for this study and has not been assessed for validity or reliability.

Conclusion

Our study results showed that parents' personal sun protection behaviors were correlated with their sun protection practices to their children. Furthermore, it indicated that even they had sun protection knowledge, parents showed suboptimal sun protection practices. Sun protection behaviors instituted from birth may reduce the risk of future skin cancers and also have an impact as behavioral guidance in the adoption of protective practices against the sun in children.

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Conflicts of interest

There are no conflicts of interest.

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