

# Psychometric Testing of the Turkish Version of the Skin Cancer and Sun Knowledge Scale in Nursing Students

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**Abstract** The present study aimed assesses the nursing students' knowledge of skin cancer and sun and their sun protection behaviors. This descriptive cross-sectional study was performed from May to June 2014 with a convenience sample of 376 undergraduate nursing students from one nursing faculty located in Izmir. Mean age of the students was  $21.56 \pm 1.96$  years. The mean score that the females obtained from the level of knowledge and protection behaviors scales was significantly higher than that of the males. Older age group ( $\geq 22$  years) obtained higher scores on the knowledge and protection behaviors scales than younger group ( $\leq 21$  years). Nursing students' knowledge of, and behavior regarding, skin cancer and sun health were insufficient. Equipping them with the necessary knowledge and behaviors related to skin cancer and sun health by developing training programs and strategies on the issue is of utmost importance.

## Introduction

A global increase in both melanoma and non-melanoma skin cancers in recent years has become a major public health problem [1, 2]. In Turkey also, skin cancer is third frequent

cancer type [3, 4]. It is the most common cancer in those between the ages of 25 and 29 years and the second most common cancer in those between the ages of 15 and 29 years [5–7]. Exposure to sunlight or artificial sources of ultra violet radiation (UVR) in the early years of life increases the risk [8, 9]. Approximately 25 % of sun exposure occurs before the age of 18, and the youth increase their risk of developing skin cancer when they expose themselves to the sun and artificial sources of UVR [10]. Community-based studies demonstrated that young population lack knowledge about sun protection behaviors and the signs of skin cancer [4, 11–14]. Since childhood and early adulthood are critical periods in the development of skin cancer in the future, children and young adults especially require primary and secondary prevention.

The primary strategy for preventing skin cancer is to limit UVR exposure through adopting environmental, social, and behavioral changes, such as wearing a high factor sunscreen, wearing protective clothing and a hat, and avoiding indoor tanning [2, 11, 15, 16]. Primary prevention alone may be insufficient for fighting skin cancer. Therefore, secondary prevention is necessary. Secondary prevention provides opportunities to diagnose the symptoms of skin cancer and treat it in its early stages [17].

Nurses have an important role in providing services for preventing, detecting, and screening skin cancer [18]. Therefore, it is important that nurses gain the necessary knowledge and skills in nursing education so that they can motivate people to change their behaviors related to skin cancer [19]. In Turkey, a limited number of previous studies revealed that nursing students and hospital staff nurses' knowledge about how to prevent skin cancer and protect from the harmful effects of the sun was insufficient [19, 20]. The present study aimed to fill the gap in the literature by investigating nursing students' knowledge of skin cancer and sun and sun protection behaviors.

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This study was aimed at determining nursing students' knowledge of skin cancer and sun and their sun protection behaviors. The specific objectives were as follows: (1) to determine the relationship between the skin cancer risk and nursing students' gender and age, (2) to determine the nursing students' responses to the Skin Cancer and Sun Knowledge (SCSK) scale, (3) to reveal the frequency of sun protection behavior displayed by the nursing students, and (4) to test the relationship between the nursing students' knowledge and behavioral scores and individual risk factors. In addition, this study assessed the validity and reliability of the Turkish version of the SCSK scale.

## Methods

### Participants and Setting

The study had a descriptive, cross-sectional design. The convenience sample of this study consisted of 376 (309 females and 67 males) undergraduate nursing students from the nursing faculty of a university located in Izmir, Turkey. All the students in the school were included in the study ( $n=625$ ). The study was conducted with volunteers. Of the students, 60.16 % volunteered to participate in the study ( $n=376$ ). The study was carried out between May 2014 and June 2014.

The data for this study was collected in classes during school hours, with the students who agreed to participate in the study. For responses not to be affected, students were asked to complete the socio-demographic characteristics, individual risk factors and sun protection behavior questions first and then the SCSK scale. The researchers accompanied the students during the data collection and guaranteed that their answers would be kept confidential. The researcher also encouraged them to complete the self-reported survey unaided and in private.

### Data Collection Questionnaire

The data were collected with a form developed by the researchers based on the literature [4, 9, 11, 14] and SCSK scale. The first part of this form included 11 questions on the socio-demographic characteristics and individual risk factors of the nursing students (age, gender, hair color, eye color, presence of freckles, presence of moles, sunburn history in the last year, family history of skin cancer, duration of sun exposure on sunny days, information resources about sun and skin cancer, knowledge about how sun exposure causes skin cancer). The second part of this form included 13 questions assessing the respondents' sun protection behaviors for sunny days in spring/summer months. The frequency of sun protection behavior displayed by the nursing students was scored as 1 = never, 2 = seldom, 3 = sometimes, 4 = very often, and

5 = always. By summing the scores obtained from the 13 items, the total score for the sun protection behavior was calculated. Higher total scores indicated that the students displayed a high level of sun protection behavior. The reliability coefficient of the second part (Cronbach's alpha) was 0.72 in this study.

The participants' skin cancer and sun health-related knowledge was assessed with SCSK scale [21]. The SCSK was developed to encompass five broad domains of knowledge: sun protection (items 1, 4–7, 16–22), tanning (items 2–12), skin cancer risk factors (items 13–15, 23), prevalence of skin cancer (items 15, 24), and signs of skin cancer (item 25). The scale has a one-factor structure, and it includes 15 true/false items and 10 multiple choice items. The correct option was scored as 1 and the incorrect option as 0. The total score was obtained by summing the item scores, which ranged from 0 to 25, with a higher score indicating a higher level of knowledge. The internal consistency and test-retest reliability of the original scale were (KR-20) 0.69 and 0.83, respectively. Furthermore, face, content, and incremental validities were established for the SCSK scale [21]. In this study, the Turkish validation of the SCSK scale was obtained. The scale was translated into Turkish using the back translation technique. The content validity was ascertained by an expert panel (specializing in public health, pediatrics, or psychiatry). The experts' scores were used to calculate the content validity index (CVI) of the scale. The CVI of the Turkish SCSK scale was calculated to be 93.71 %, which indicated satisfactory agreement among the experts. The internal consistency of the SCSK scale was (KR-20) 0.51, and the 2-week test-retest reliability was 0.52 ( $n=34$ ),  $p<0.001$ . The discriminant validity of the SCSK scale was assessed by a single true/false item: "Does sun exposure cause skin cancer?" The mean score obtained by those who responded this item as "true" ( $15.7 \pm 2.4$ ) was significantly higher than that obtained by those who responded "false" ( $12.1 \pm 2.5$ ) ( $p<0.001$ ).

### Statistical Analysis

The data were analyzed using SPSS version 16.0, and the statistical significance was defined as  $p<0.05$ . The students' characteristics were summarized using descriptive statistics. The chi-square test was used to compare the students' individual risks in terms of gender and age groups. The independent sample  $t$  test and ANOVA test were used to compare the students' knowledge and behavior scores in terms of their risks.

### Ethical Considerations

Ethical approval for the research was obtained from the ethical committee of Dokuz Eylul University and written permission from the directorate of the Nursing Faculty. Moreover, the

verbal consent of the nursing students was received. The students were informed about the aim and design of the study. They were told that participation was voluntary and guaranteed that their identities and responses would be kept confidential.

## Results

### Characteristics of the Participants

Of the respondents, 82.2 % were female. Their mean age was  $21.56 \pm 1.96$  years. Moreover, 32.4 % had fair hair, 25.8 % had light-colored eyes, 19.4 % had freckles, 79.3 % had moles, 3.2 % had a family history of skin cancer, 28.7 % had suffered sunburn in the previous year, and 39.9 % stayed in the sun for more than 2 h on sunny days. The students obtained information about sun and skin cancer from the media (67.9 %), school (45.8 %), family (29.1 %), and peers (19.8 %). The majority of the respondents (82.7 %) stated that exposure to the sun would cause skin cancer.

### Relationship Between the Students' Risk Factors and Gender and Age

Table 1 displays the distribution of the students' risk factors by gender and age. The relationship between gender and risk factors revealed that females constituted the great majority of the students with fair hair (35.9 %), freckles (22.3 %), and a history of sunburn in the previous year (31.1 %). This difference between the sexes was statistically significant ( $p < 0.05$ ). Females also accounted for the majority of those who had light-colored eyes, moles on the face and upper extremities, a family history of skin cancer, stayed in the sun for more than 2 h during the day (27.5, 80.3, 3.6, and 40.8 %, respectively). However, these differences were not statistically significant ( $p > 0.05$ ). According to the distribution of risk factors in terms of the students' mean age, 28.5 % with light-colored eyes and 31.8 % who suffered sunburn in the previous year were in the  $\leq 21$  years of age group. These differences are not statistically significant ( $p > 0.05$ ). The majority (24.0 %) of the students who stated that exposure to the sun would not cause skin cancer were also in the  $\leq 21$  years of age group, and the difference was statistically significant ( $p < 0.05$ ).

### Students' Skin Cancer- and Sun-Related Knowledge

The majority of the students' responses to the items on the SCSK scale were correct. The common incorrectly answered items were as follows: "Sunbathing for only a couple of weeks a year (e.g., when on holiday) increases your likelihood of getting skin cancer," "Gradual tanning eliminates most of

the negative effects of lengthy exposure to the sun," "A tan is a sign that the skin is damaged," "Damage caused by the sun can be repaired by..." "What type of clothing usually blocks more UVR (from the sun)," "What does SPF 30 mean," "Can you get a sunburn," "What is the most common form of skin cancer," and "Which of the following could be a sign of skin cancer" (Table 2).

### Students' Skin Cancer/Sun Protection Behaviors

Based on the number of "always" and "very often" responses given regarding sun protection behaviors, the student's most common behaviors were as follows: avoiding solariums (87.4 %), staying in the shade when outdoors (84 %), wearing sunglasses (50.8 %), checking moles and unusual changes in the skin regularly (44.8 %), not sunbathing between 10:00 a.m. and 4:00 p.m. (43.7 %), not swimming between 10:00 a.m. and 4:00 p.m. (39.1 %), not being outside between 10:00 a.m. and 4:00 p.m. (34.8 %), wearing sunscreen with a sun protection factor (SPF) of 15 or higher (33.7 %), wearing sunscreen at the beach or while swimming and doing physical activity outside every 2 h (33.7 %), wearing clothing that covers the skin (26.8 %), going to the doctor to treat sunburn (26.3 %), wearing a hat (22.3 %), and using an umbrella (11.7 %).

### Relationship between the Students' Risk Factors and Skin Cancer/Sun Knowledge and Protection Behaviors

Table 3 shows the relationship between the students' risk factors and skin cancer/sun knowledge and protection behaviors. The difference between the sexes in terms of the level of knowledge and protection behaviors was significant ( $p < 0.05$ ). The mean score that the females obtained from the level of knowledge and protection behaviors scales was significantly higher than that of the males ( $40.22 \pm 7.73$  and  $15.28 \pm 2.74$ , respectively). The comparison by age groups revealed that those in the  $\geq 22$  years of age group obtained higher scores on the knowledge and protection behaviors scales ( $15.62 \pm 2.52$  and  $41.11 \pm 7.93$ , respectively) than those in the  $\leq 21$  years of age group ( $p < 0.05$ ). The knowledge score of the group that answered "yes" to the question "Does sun exposure cause skin cancer?" was statistically significantly higher than that of the group that answered "no" ( $15.70 \pm 2.48$  and  $12.16 \pm 2.58$ , respectively;  $p < 0.05$ ). No statistically significant relationship was determined between hair color, eye color, presence of freckles, presence of moles on the upper limbs and face, sunburn history in the previous year, family history of skin cancer, sun exposure on sunny days variables, and the skin cancer/sun knowledge and protection behavior scales.

**Table 1** Distribution of the students' risk factors by gender and age

Factors	Gender ( <i>n</i> = 376)					Age ( <i>n</i> = 350)				
	Males		Females		<i>p</i>	≤21		≥22		<i>p</i>
	<i>n</i>	%	<i>n</i>	%		<i>n</i>	%	<i>n</i>	%	
Hair color										
Fair	11	16.4	111	35.9	0.001*	57	31.8	55	32.2	0.949
Dark	56	83.6	198	64.1		122	68.2	116	67.8	
Eye color										
Light	12	17.9	85	27.5	0.104	51	28.5	41	24.0	0.337
Dark	55	82.1	224	72.5		128	71.5	130	76.0	
Presence of freckles										
Yes	4	6.0	69	22.3	0.001*	32	17.9	37	21.6	0.377
No	63	94.0	240	77.7		147	82.1	134	78.4	
Presence of moles on upper limbs and face										
Yes	50	74.6	248	80.3	0.303	137	76.5	140	81.9	0.219
No	17	25.4	61	19.7		42	23.5	31	18.1	
A history of sunburn in the previous year										
Yes	12	17.9	96	31.1	0.030*	57	31.8	42	24.6	0.131
No	55	82.1	213	68.9		122	68.2	129	75.4	
A history of skin cancer in the family										
Yes	1	1.5	11	3.6	0.338	4	2.2	7	4.1	0.319
No	66	98.5	298	96.4		175	97.8	164	95.9	
Sun exposure on sunny days (hour/a day)										
<1 h	7	10.4	36	11.7	0.658	17	9.5	24	14.0	0.081
1–2 h	36	53.7	147	47.6		96	53.6	72	42.1	
>2 h	24	35.8	126	40.8		66	36.9	75	43.9	
Does sun exposure cause skin cancer?										
Yes	54	80.6	257	83.2	0.613	136	76.0	159	93.0	0.000*
No	13	19.4	52	16.8		43	24.0	12	7.0	

\*chi-square test,  $p < 0.05$ 

## Discussion

The findings of this research revealed that female students' risk of skin cancer and rates of having fair hair, freckles, or having suffered sunburn in the previous year were more than their male counterparts. The risk assessment of the sample group by age distribution demonstrated that the ≤21-year-old students' risk of skin cancer, light-colored eyes, having suffered sunburn in the previous year, or not knowing that sunburn causes skin cancer were more than their older counterparts. Similarly, in their study conducted on first- and fourth-year nursing students, Yilmaz et al. determined that the first-year students, whose mean age was lower than that of the fourth-year students, lacked sun protection knowledge and behavior, and were at a higher risk of skin cancer [19]. This result may be associated with the fact that programs on cancer and prevention were not included in the curriculum of the students in the younger age groups, and that they did not acquire sufficient knowledge and prevention behavior in their previous years of education. These findings confirmed that the curriculum of nursing schools should include not only

professional training but also programs aiming to provide students with knowledge of, and positive behaviors regarding, sun exposure and skin cancer.

The results indicated that the majority of the students correctly answered the questions about skin cancer and the effects of the sun. On the other hand, most of the students did not correctly answer the following questions on tanning, sun protection, the prevention of skin cancer, and symptoms of skin cancer: "Sunbathing for only a couple of weeks a year (e.g., when on holiday) increases your likelihood of getting skin cancer," "Gradual tanning eliminates most of the negative effects of lengthy exposure to the sun," "A tan is a sign that the skin is damaged," "Damage caused by the sun can be repaired by...", "What type of clothing usually blocks more UVR (from the sun)," "What does SPF 30 mean," "Can you get a sunburn," "What is the most common form of skin cancer," and "Which of the following could be a sign of skin cancer." Similarly, several previous studies revealed that university students did not correctly answer questions on the effects of sunlight, sun protection, and the signs of skin cancer [4, 22–24]. This result confirms that there is insufficient

**Table 2** Responses given to the Skin Cancer-Sun Knowledge Scale ( $n = 376$ )

	Correct (%)
1. I should stay out of the sun if my shadow is shorter than my body.	319 (84.8)
2. Sunbathing for only a couple of weeks a year (e.g., when on holiday) increases your likelihood of getting skin cancer.	122 (32.4)
3. Solariums/sun beds are a safe way to get a tan.	312 (83.0)
4. When using sunscreen, you can tan without any negative effects.	209 (55.6)
5. Having a tan protects my skin from the sun.	292 (77.7)
6. A fake/spray on tan provides me with no protection from the sun.	306 (81.4)
7. Keeping your skin tanned at a solarium during the winter protects it from sun damage during the summer.	339 (90.2)
8. Gradual tanning eliminates most of the negative effects of lengthy exposure to the sun.	111 (29.5)
9. A tan is a sign that the skin is damaged.	137 (36.4)
10. UVR (ultraviolet rays) from tanning beds is safer than UVR from the sun.	324 (86.2)
11. Tanning is an unsafe way to get the vitamin D your body needs.	204 (54.3)
12. A tan is a sign of good health.	94.7 (94.7)
13. If you are not usually exposed to the sun, being severely sunburned two or three times during your life will probably not increase your chances of skin disease.	254 (67.6)
14. The only way a person can get skin cancer is from too much exposure to the sun.	345 (91.8)
15. People with dark skin cannot get skin cancer.	360 (95.7)
16. When should sunscreen be applied for best protection?	315 (83.8)
17. How often should SPF 30 sunscreen be reapplied?	291 (77.4)
18. When is the sun the strongest?	307 (81.6)
19. Damage caused by the sun can be repaired by:	103 (27.4)
20. What type of clothing usually blocks more UV radiation (from the sun)?	17 (4.5)
21. What does SPF 30 mean?	126 (33.5)
22. Can you get a sunburn?	96 (25.5)
23. Which of the following increases your risk of skin cancer?	225 (59.8)
24. What is the most common form of skin cancer?	50 (13.3)
25. Which of the following could be a sign of skin cancer?	154 (41.0)

knowledge about the sun exposure and skin cancer among university students. In order to raise nursing students' awareness of skin cancer and give them knowledge of, and positive behaviors regarding, skin cancer, social networks for the youth can be utilized more, besides making improvements in the curriculum. In addition, community-based initiatives developed by cooperating with their peers, parents, and educators can be used to access the youth and give them role models [25].

While "avoiding solariums" and "staying in the shade when outdoors" were among the sun protection behaviors displayed most by the students, "using an umbrella" and "wearing a hat" were among the sun protection behaviors displayed least by the students. Another study conducted on Turkish university students also determined that of the protection behaviors displayed by the students, the most and least common ones were "staying in the shade" and "using an umbrella," respectively [4]. In studies conducted with adolescents in other countries, "wearing sunglasses" and "wearing sunscreen" were the most common sun protection methods and "wearing protective clothing and a hat" was the least common

method [23, 26]. The sun protection behaviors displayed by the students may have been associated with their perceived barriers and facilitators. Therefore, targeting the barriers (perceived inconvenience, preference to acquire a tan, etc.) and strengthening the facilitators (having sun protection as part of the daily routine, etc.) would be the most important ways to promote students' sun protection behaviors. Even though it is hard to change students' perceptions and attitudes, providing information about their individual risks and the relationship between the risks and disease can encourage them to make positive changes in their sun protection behaviors [27].

The study findings confirmed that the nursing students' knowledge of, and protection behaviors regarding, skin cancer were significantly affected by gender and age, as did the findings of other similar studies [14, 28–31]. This may account for why younger or male students exposed themselves to sunlight more and why they protected themselves from the harmful effects of sunlight less than did their older or female counterparts. Younger male students' heightened exposure to the sun may be associated with the fact that they participate more in outdoor activities, such as sports and recreation. On the other



**Table 3** Students' skin cancer-sun knowledge and protection behavior based on risk factors

Variables	Knowledge ( <i>n</i> = 376)				Protection behavior ( <i>n</i> = 376)			
	<i>n</i>	Mean ± SD	<i>t/F</i>	<i>p</i>	<i>n</i>	Mean ± SD	<i>t/F</i>	<i>p</i>
Sex								
Male	67	14.19 ± 3.05	2.886	0.004*	64	37.40 ± 7.74	2.634	0.009*
Female	309	15.28 ± 2.74			286	40.22 ± 7.73		
Age								
21 years and ↓	179	14.79 ± 2.81	-2.884	0.004*	154	38.01 ± 7.19	-3.672	0.000*
22 years and ↑	171	15.62 ± 2.52			171	41.11 ± 7.93		
Hair								
Light	122	14.96 ± 2.83	-0.584	0.559	114	39.72 ± 7.84	0.032	0.974
Dark	254	15.14 ± 2.83			236	39.69 ± 7.79		
Eye								
Light	97	15.13 ± 2.58	0.176	0.861	91	39.81 ± 8.07	0.149	0.882
Dark	279	15.07 ± 2.91			259	39.67 ± 7.71		
Presence of freckles								
Yes	73	15.52 ± 2.78	1.448	0.149	71	40.30 ± 8.25	0.727	0.468
No	303	14.98 ± 2.83			279	39.55 ± 7.69		
Presence of moles on the upper limbs and face								
Yes	298	15.13 ± 2.79	0.586	0.558	277	39.70 ± 8.04	-0.021	0.983
No	78	14.92 ± 2.99			73	39.72 ± 6.83		
A history of sunburn in the previous year								
Yes	108	15.23 ± 2.73	0.613	0.540	102	38.42 ± 8.83	-1.835	0.068
No	268	15.03 ± 2.87			248	40.23 ± 7.28		
A history of skin cancer in family								
Yes	12	15.25 ± 1.86	0.198	0.843	12	43.91 ± 6.22	1.909	0.057
No	364	15.08 ± 2.85			338	39.55 ± 7.81		
Sun exposure on sunny days (hour/a day)								
< 1 h	43	15.69 ± 2.50	1.769	0.172	42	41.42 ± 7.40	1.274	0.281
1–2 h	183	14.85 ± 3.01			166	39.66 ± 7.72		
> 2 h	150	15.20 ± 2.67			142	39.24 ± 7.98		
Does sun exposure cause skin cancer?								
Yes	311	15.70 ± 2.48	10.361	0.000*	310	39.77 ± 7.74	0.438	0.662
No	65	12.16 ± 2.58			40	39.20 ± 8.31		

\*Independent sample *t* test, *p* < 0.05

hand, older or female students being more knowledgeable about, and displaying more positive behaviors regarding, skin cancer may result from the fact that they are more sensitive to health-related issues, pay more attention to skin care, and avoid further exposure to the sun [30, 32].

### Limitations of Study

The limitation of this study was that although the sample was composed of students from diverse backgrounds, the results cannot be generalized to all young adults in Turkey.

### Conclusion and Implications

The findings of the present study provided an empirical support for use of Turkish version of Skin Cancer and Sun

Knowledge Scale in the nursing students. Risk factors for skin cancer including fair hair, presence of freckles, and sunburn history in the previous year were identified as more common among female students. Turkish nursing students' knowledge of, and behavior regarding, skin cancer and sun health were insufficient. Also, male and younger age group students had a lower level of knowledge and exhibited worse sun protection behaviors. Further, health promotion education to sun safety and prevention of skin cancer in nursing curriculum is essential for improving students' sun safety. So, efficient health education strategies on the use of sun protection behaviors in the youth will facilitate the prevention of skin cancer [33]. Besides, the integration of clinical practice guidelines to education programs would help to increase the cancer awareness and early diagnosis. Therefore, the development and dissemination of using clinical practice guidelines for young

population is a priority for the public health promotion. Since nursing students are to be actively involved in protecting and improving the health of individuals and communities, equipping them with the necessary knowledge and behaviors related to skin cancer and sun health by developing training programs and strategies on the issue is of utmost importance. Public education strategies, such as mass media campaigns, university programs, health care programs, and organized sports programs promote nursing students' knowledge of, and behaviors regarding, skin cancer and sun safety and thus can help to raise awareness of skin cancer.

### Compliance with Ethical Standards

**Ethics Statement** This study was reviewed and approved by the Dokuz Eylül University Ethical Committee.

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