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NURSING STUDENTS' HEALTH BELIEFS REGARDING SKIN CANCER: A DESCRIPTIVE AND ANALYTICAL CROSS-SECTIONAL STUDY

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Abstract

Objective: This study aimed to assess the health beliefs of nursing students concerning skin cancer.

Methods: The research was conducted between April 1, 2025, and July 1, 2025, among students studying at the Faculty of Health Sciences, Department of Nursing at a state university in Istanbul, Türkiye.

Results: According to the Health Belief Model Scale for Skin Cancer, the mean score for perceived susceptibility was 25.48±3.54, perceived severity was 16.31±2.58, perceived benefits were 22.68±3.77, perceived barriers were 14.85±3.53, and self-efficacy was 22.96±3.78. Female students had higher scores for perceived susceptibility, perceived severity, perceived benefits, and self-efficacy compared to male students. Students with blue/green or hazel eyes had higher perceived severity scores than those with black eyes. Students who had received prior information about skin cancer demonstrated higher perceived susceptibility and self-efficacy scores. Students who performed self-skin examination were found to have higher perceived susceptibility, perceived barriers, and self-efficacy scores. Students who used sunscreen had higher perceived susceptibility, perceived severity, perceived benefits, and self-efficacy scores compared with those who did not use sunscreen. In the multiple regression analysis, female gender and prior knowledge of skin cancer were identified as significant predictors of perceived susceptibility scores. Additionally, female gender and having fair skin were found to be positive predictors of perceived severity scores.

Conclusion: The health beliefs of nursing students regarding skin cancer were found to be at a moderate level. Female gender, prior knowledge about skin cancer, and having fair skin were identified as significant predictors of these health beliefs.

Keywords: *Health belief model, nursing, skin cancer, students.*

Introduction

Nebivolol, Skin cancer is a prevalent global health concern and a serious medical issue with far-reaching implications worldwide.[1] Skin cancers, which originate in the skin and are caused by the proliferation of abnormal cells, are characterized by invasion into other parts of the body.[2] Among cancer types, skin cancers, which have a high incidence globally, are becoming increasingly prevalent worldwide.[3-5]

Skin cancer is caused by various factors such as ultraviolet (UV) exposure, genetic predisposition, and environmental risk factors. UV radiation triggers the development of skin cancer by causing DNA damage and mutations. UV rays cause the formation of free radicals and suppression of the immune system, especially in fair-skinned individuals and those who are exposed to the sun for long periods of time.[2,4] Non-melanoma skin cancers are more common in older individuals and in those exposed to other factors such as ionizing radiation. Human Papilloma Virus (HPV) infection can increase the development of squamous cell carcinoma (SCC), especially in patients with compromised immune systems. Chemicals such as arsenic can also contribute to skin cancer.[2-4]

Skin cancers are divided into two types: melanoma and non-melanoma. Non-melanoma skin cancers, also known as keratinocyte skin cancer, are divided into two types: squamous cell carcinoma (SCC) and basal cell carcinoma (BCC). BCC is the most common malignant tumor in humans and accounts for 60% of all skin tumors.[6] Melanoma is known as an aggressive type of skin cancer that is feared more than keratinocyte skin cancer worldwide, which has a high mortality rate, tends to metastasize frequently, and is resistant to treatment.[3,7] It is caused by the abnormal proliferation of melanocytes.[1] The incidence of keratinocyte skin cancer is much higher than that of melanoma, but the mortality rate of keratinocyte skin cancer is much lower than that of melanoma.[1,3] Melanomas account for only about 1% of all malignant skin tumors when compared to other skin lesions.[1] It accounts for up to 90% of skin cancer deaths. However, with early diagnosis of melanoma, the 5-year survival rate can reach up to 95%.[4]

According to Global Cancer Observatory (GLOBOCAN) 2022 data, 331,722 new melanoma cases were diagnosed worldwide. It is the 17th most common cancer type among all cancer cases, resulting in approximately 58,667 deaths. Non-melanoma skin cancers were diagnosed in approximately 1,234,533 new cases worldwide. They ranked 5th among all cancers, resulting in 69,416 deaths.[8] In Türkiye, between 2010 and 2021, 52.4% of the 1,507 patients diagnosed with skin cancer who visited dermatology clinics had BCC, 36.4% had SCC, and 11.2% had melanoma.[9]

Implementing strategies that minimize exposure to ultraviolet radiation reduces the risk of skin cancer. These include physical (shade, protective clothing, hats, UV-filtered sunglasses), topical (sunscreen, antioxidants), and systemic (nutritional supplements (especially vitamin D supplements), chemopreventive agents) protection methods.[6,10,11] Education and behavioral interventions are critical, especially for children and young adults, and supporting them with community-based campaigns and policies is important for primary prevention.[6,11]

A study conducted on university students found differences between students' personal characteristics and skin cancer, knowledge about the sun, and levels of sun protection.[12] In a study conducted by Baghani et al., it was found that although medical students and practicing physicians had a good level of knowledge about skin cancer, their attitudes and behaviors were inadequate.[13] Aksoy et al. conducted a study among fifth- and sixth-year medical students and found that students lacked sufficient awareness regarding melanoma prevention and early diagnosis, indicating a need for new approaches.[14]

Developing the right protective behaviors against skin cancer is also very important in terms of public health. In order to develop protective behaviors against skin cancer, it is first necessary to assess the community's knowledge, attitudes, and beliefs regarding skin cancer.[15] The Health Belief Model proposes that individuals' health behaviors are influenced by beliefs, values, and attitudes. This model is used to explain protective behaviors against various diseases. The model proposes that people engage in protective actions and exhibit protective health behaviors.[15,16]

It is important for nursing students, who will serve as the nurses of the future, to have comprehensive knowledge about skin cancer prevention, to exhibit healthy behaviors, and to raise public awareness on this issue. Therefore, this study aimed to determine the health beliefs of nursing students regarding skin cancer.

Research Questions

- What are the health beliefs of nursing students regarding skin cancer?
- Is there a relationship between the health beliefs of nursing students regarding skin cancer and their descriptive characteristics?
- What are the predictors influencing the Health Belief Model scores in skin cancer?

Methods

Purpose of the Study

This study was designed as a descriptive and analytical cross-sectional study to determine the health beliefs of nursing students regarding skin cancer.

Location and Time of Study

The study was conducted between April 1, 2025, and July 1, 2025, among undergraduate students studying at the Faculty of Health Sciences, Department of Nursing, at a state university in Istanbul, Türkiye.

The Sample of the Study

The sample size for the study was calculated using the G*Power 3.1.9.7 program.[17] A sample size calculation was performed for the independent groups t-test. In the calculation, an effect size of 0.50 (d=0.50),[18,19] a 5% error margin (α=0.05), and 80% power were used, resulting in a minimum sample size of 128. In the post hoc power analysis conducted as a result of the study, with an effect size d=0.47 (Cohen's d=0.47 was taken between gender and perceived susceptibility), α=0.05, and a total sample of 429, the power was determined to be 0.97. The sample size was found to be sufficient. In the study, students were selected using a convenience sampling method. Only those who agreed to participate during the data collection process were included. During the data collection process, 429 out of approximately 800 students enrolled in the Department of Nursing were reached.

Data Collection Method and Tools

A Student Assessment Form and the Health Belief Model Scale in Skin Cancer were used for data collection. Data were collected in class before or after the lesson via a Google survey (online). Collecting data from one student takes approximately 20 minutes.

Table 1. Descriptive characteristics of students (n=429).

Variables	n	%
Gender		
Female	359	83.68
Male	70	16.32
Marital Status		
Single	423	98.60
Married	6	1.40
Class		
First grade	75	17.48
Second grade	147	34.27
Third grade	106	24.71
Fourth grade	101	23.54
The place where you have lived the longest		
Province	262	61.07
District	115	26.81
Village	52	12.12
The region where you lived the longest		
Marmara region	221	51.52
Southeastern Anatolia region	66	15.38
Black Sea region	51	11.89
Eastern Anatolia region	49	11.42
Aegean/Mediterranean region	29	6.76
Central Anatolia region	13	3.03
Economic situation		
Income equals expenses	256	59.67
Income is lower than expenses	93	21.68
Income is higher than expenses	80	18.65

Student Assessment Form: This form was prepared based on a literature review[15,20] and consists of a total of 22 questions related to students' sociodemographic characteristics and skin (age, gender, marital status, education level, occupation, skin type, presence of skin lesions, etc.).

The Health Belief Model Scale in Skin Cancer: Developed by Doğan and Caydam (2020) to assess attitudes and beliefs regarding skin cancer. It is a 26-item scale consisting of five subscales. Based on the Health Belief Model, the scale is a five-point Likert scale, with each item rated as 5-strongly agree, 4-agree, 3-undecided, 2-disagree, and 1-strongly disagree. The subdimension of scale are perceived susceptibility, perceived benefit, perceived severity, perceived barrier, and self-efficacy. The total Cronbach's alpha coefficient of the scale is 0.86, and the coefficients for subdimensions are 0.89, 0.79, 0.77, 0.65, and 0.86, respectively. Items in the perceived barrier subscale are reverse-coded. The other subscales are coded normally. There is no total score for the scale; each subdimension is scored separately. Higher scores on Perceived susceptibility, perceived benefits, perceived severity, and self-efficacy indicate higher perceived susceptibility, perceived benefits, perceived severity, and self-efficacy. However, a low perceived barriers score indicates higher perceived barriers. The developed scale is valid and reliable.[15] In this study, the Cronbach's a value of the scale was found to be 0.89.

Data Analysis

Analyses were performed using the SPSS statistical program. Skewness and kurtosis values were used to examine whether the research variables showed a normal distribution. The variables were found to show a normal distribution. Therefore, parametric methods were used. The independent groups t-test and one-way analysis of variance (ANOVA) were used to examine differences in scale scores according to the descriptive characteristics of the students. In post hoc analyses, if the variances were homogeneous according to Levene's test, the Bonferroni test (p>0.05) was used, and if the variances were not homogeneous, the Games-Howell test (p<0.05) was used. Multiple linear regression analysis (enter model) was performed to determine the effect of some variables on the Health Belief Model in Skin Cancer.

Table 1 (continued). Descriptive characteristics of students (n=429).

Variables	n	%
Is there anyone around you with skin cancer?		
No	409	95.34
Yes	20	4.66
Get information about skin cancer		
No	262	61.07
Yes	167	38.93
Eye color		
Brown	314	73.19
Hazel	60	13.99
Black	32	7.46
Blue/green	23	5.36
Skin color		
Fair-skinned	195	45.45
Light brown	131	30.54
Brown-dark	103	24.01
Sunburn in the past year		
Never	212	49.42
Once	103	24.01
Twice or more	114	26.57
Self-skin examination		
No	302	70.40
Yes	127	29.60
Wearing sunglasses		
Yes	230	53.61
No	199	46.39
Sunscreen		
Yes	356	82.98
No	73	17.02
Wearing a hat		
No	286	66.67
Yes	143	33.33
Age mean ±Sd (min-max)	21.11±2.72 (18–45)	

Sd: Standard Deviation, Min: Minimum, Max: Maximum

Results

83.68% of the students were female, and 98.60% were single. 34.27% were in their second grade, and 24.71% were in their third grade. 61.7% lived in the province, and 51.52% lived in the Marmara region. 59.67% had an income equal to their expenses. 4.66% had someone in their around with skin cancer, 38.93% had previously received information about skin cancer, 73.19% had brown eyes, 45.45% had fair skin, and 49.42% had never had a sunburn. It was found that 29.60% performed self-skin examinations, 53.61% wore sunglasses in sunny weather, 82.98% used sunscreen, and 33.33% wore hats. The mean age of the students was 21.11±2.72. (Table 1).

According to the health belief model scale for skin cancer, the perceived susceptibility mean score was 25.48±3.54, the perceived severity mean score was 16.31±2.58, the mean perceived benefits score was 22.68±3.77, the mean perceived barriers score was 14.85±3.53, and the mean self-efficacy score was 22.96±3.78 (Table 2).

Table 2. The health belief model scale scores in skin cancer.

Subdimensions	Mean±Sd	Min	Max
Perceived susceptibility	25.48±3.54	6	30
Perceived severity	16.31±2.58	4	20
Perceived benefits	22.68±3.77	6	30
Perceived barriers	14.85±3.53	4	20
Self-efficacy	22.96±3.78	6	30

Sd: Standard Deviation, Min: Minimum, Max: Maximum.

Perceived susceptibility among female students (t(80.47)=3.15, p=.002, Cohen's d (d)=0.47), perceived severity (t(81.30)=3.15, p=.002; d=0.46), perceived benefit (t(427)=2.90, p=.004; d=0.36), and self-efficacy (t(84.24)=3.01, p=.003; d=0.43) scores were found to be higher than those of male students (Table 3).

A difference was found between the student's grade level and perceived barriers score (F(3;425)=5.40, p=.001, eta-squared (η^2)=0.04). First-grade students' barriers scores were found to be lower than those of third and fourth graders. Second-grade students' perceived barriers scores were found to be higher than those of third graders (Table 3).

A difference was found between the region where students lived the longest and their perceived susceptibility score (F(5;423)=2.61, p=.024, η^2=0.03). Students living in the Aegean/Mediterranean region had a higher perceived susceptibility score than students living in the Central Anatolia region. A difference was found between students' perceived barriers scores and region (F(5;423)=3.28, p=.006, η^2=0.04). Students living in the Aegean/Mediterranean region had higher perceived barrier scores than students living in the Central Anatolia and Eastern Anatolia regions (Table 3).

A difference was found between students' eye color and perceived severity scores (F(3;425)=3.28, p=.021; η^2=0.02). Students with blue/green and hazel eyes had higher perceived severity scores than students with black eyes. A difference was found between students' eye color and their self-efficacy scores (F(3;425)=3.46, p=.016, η^2=0.02). Students with blue/green and brown eye color had higher self-efficacy scores than students with black eye color (Table 3).

A difference was found between students' skin color and their perceived severity score (F(2;426)=5.15, p=.006, η^2=0.02). Fair-skinned students were found to have a higher perceived severity score than brown-skinned students (Table 3).

A difference was found between the occurrence of sunburn and perceived susceptibility scores (F(2;426)=7.29, p<.001; η^2=0.03). Students who experienced ≥2 sunburns in a year had lower perceived susceptibility scores compared to students who had none or only one. A difference was observed between sunburn status and self-efficacy scores (F(2;426)=3.74, p=.024; η^2=0.02). Students who had never experienced sunburn had higher self-efficacy scores than students who had experienced ≥2 sunburns (Table 3).

Students who received prior information about skin cancer had higher perceived susceptibility (t(427)=2.83, p=.005; d=0.29) and self-efficacy (t(427)=2.38, p=.018, d=0.24) scores compared to students who did not receive information (Table 3).

The perceived susceptibility (t(427)=2.73, p=.007; d = 0.29), perceived barriers (t(427) =2.89, p=.004; d=0.31), and self-efficacy (t(427)=2.90, p=.004; d=0.31) scores of students who performed self–skin examinations were found to be higher than those of students who did not (Table 3).

The perceived susceptibility (t(86.91)=2.63, p=.010; d=0.37), perceived severity (t(88.07) =2.27, p=.026; d=0.32), perceived benefits (t(427)=3.59, p<.001; d=0.45), and self-efficacy (t(90.61)=3.89, p<.001; d=0.54) scores of students who used sunscreen were found to be higher than those of students who did not use sunscreen (Table 3).

In multiple regression analysis, the effects of gender, prior knowledge about skin cancer, self-skin examination, use of sunscreen, and skin color as independent variables on the subdimensions scores of the Health Belief Model for Skin Cancer were examined. Model 1 explains 7.1% of the total variance in perceived susceptibility (F (5;423)=6.54, p<.001, R^2=.071). Female gender and prior knowledge about skin cancer were found to be significant predictors of perceived susceptibility scores. Accordingly, being female increased perceived susceptibility scores compared to being male, and having prior knowledge about skin cancer increased perceived susceptibility scores compared to those without such knowledge.

Model 2 explains 6.1% of the total variance in perceived severity (F(5;423)= 5.521, p<.001; R^2=0.061). Female gender and fair skin tone were found to be positive predictors of perceived severity scores.

The model 3 explains 4.8% of the total variance in perceived benefits (F(5;423)=4.305, p<.001; R^2=0.048). Performing self-skin examination was identified as a negative predictor, whereas use of sunscreen was a positive predictor of the perceived benefits score.

Model 4 explains 3.5% of the total variance in perceived barriers (F(5;423)=3.078, p=.010, R^2=0.035). Performing self-skin examination was found to be a positive predictor of perceived barrier scores.

Model 5 explains 7.9% of the total variance in self-efficacy (F(5;423)=7.326, p<.001, R^2=0.079). Performing self-skin examination and using sunscreen were found to be positive predictors of self-efficacy scores (Table 4).

Discussion

Traumatic In this study, according to the health belief model scale in skin cancer, students' perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and self-efficacy were found to be at a moderate level. In a study conducted by Dogan and Caydam among health sciences faculty students, it was also determined that they scored at a moderate level on the subscales of the skin cancer health belief model scale.20 In a systematic review of 21 studies, medical students' attitudes toward skin cancer were found to be lower than those toward other types of cancer. Their

knowledge level about skin cancer was determined to be moderate to high.[21] Another study conducted among university students found that students lacked knowledge about skin cancer, its prevention, and early diagnosis.[22] In the Shelestak and Lindow study, individuals' perceived sensitivity, motivation, and awareness scores regarding skin cancer were found to be moderate, and perceived severity scores were found to be low.[23] The studies support our work. They highlight the necessity of awareness and education programs aimed at increasing students' knowledge levels and health beliefs.

Table 3. Comparison of health belief model scores in skin cancer according to students' demographic characteristics.

Variables		Perceived susceptibility	Perceived severity	Perceived benefits	Perceived barriers	Self-efficacy
	n	Mean±Sd	Mean±Sd	Mean±Sd	Mean±Sd	Mean±Sd
Gender						
Female	359	25.79± 3.13	16.53±2.31	22.91±3.64	15.01± 3.43	23.25± 3.49
Male	70	23.89± 4.87	15.17± 3.47	21.50±4.20	14.06± 3.92	21.46± 4.74
t/p		3.15/**.002**	3.15/**.002**	2.90/**.004**	1.89/.061	3.01/**.003**
Class						
a. First	75	24.92±4.22	16.31±2.87	21.84±4.07	13.75+4.31	22.73±4.47
b.Second	147	25.94±2.97	16.47±2.24	23.01±3.50	15.54+3.01	23.57±3.08
c.Third	106	25.47±3.83	16.33±2.73	22.75±4.18	14.38+3.74	22.76±4.12
d.Fourth	101	25.25±3.40	16.06±2.66	22.76±3.39	15.18+3.10	22.43±3.69
F/p		1.60/.188	0.51/.678	1.66/.175	5.40/**.001**/a<b.d;b>c	2.16/.092
Region						
a.Black Sea	51	24.69±4.57	15.51±3.14	22.02±4.40	14.55±3.82	22.76±4.59
b.Marmara	221	25.71±3.00	16.53±2.40	22.92±3.51	15.15±3.17	23.14±3.55
c.Aegean/Mediterranean	29	26.41±2.58	16.03±2.64	22.52±3.76	16.03±2.53	23±2.87
d.Central Anatolia	13	22.92±4.65	16.00±3.32	21.92±3.77	12.69±2.78	22.77±3.44
e. Eastern Anatolia	49	25.18±4.06	16.55±2.79	22.51±4.37	13.63±4.77	23.08±4.20
f. Southeastern Anatolia	66	25.65±3.79	16.20±2.28	22.74±3.64	14.91±3.56	22.41±3.97
F/p		2.61/**.024**/c>d	1.53/.180	0.63/.674	3.28/**.006**/c>d,e	0.42/.833
Eye color						
a.Blue/Green	23	24.87±4.88	17.13±2.56	23.13±4.52	13.87±4.22	24.13±3.98
b.Hazel	60	25.90±3.60	16.77±2.61	23±3.89	15.25±3.62	23.10±3.87
c.Brown	314	25.59±3.11	16.27±2.42	22.70±3.55	14.91±3.43	23.03±3.52
d. Black	32	24.12±5.57	15.25±3.56	21.56±4.86	14.25±3.75	21.09±5.22
F/p		2.19/.089	3.28/**.021**/a>d;b>d	1.20/.310	1.19/.312	3.46/**.016**/a>d;c>d
Skin tone						
a.Fair skin	195	25.61±3.29	16.67±2.55	22.71±3.90	15.10±3.54	23.21±3.82
b.Light brown	131	25.57±3.83	16.28±2.52	22.72±3.82	14.80±3.47	22.84±3.71
c.Brown-dark	103	25.14±3.61	15.67±2.59	22.58±3.45	14.45±3.56	22.62±3.78
F/p		0.65/.521	5.15/**.006**/a>c	0.05/.953	1.19/.306	0.91/.404
Sunburn						
a.Never	212	25.65±3.53	16.34±2.52	22.74±3.65	14.97±3.51	23.25±3.89
b.Once	103	26.24±2.89	16.41±2.68	23.12±3.87	14.78±3.81	23.25±3.37
c. ≥2	114	24.49±3.87	16.16±2.62	22.18±3.85	14.71±3.30	22.13±3.81
F/p		7.29/**<.001/c<a,b**	0.29/.748	1.71/.182	0.23/.797	3.74/**.024**/a>c
Skin cancer information						
Yes	167	26.08±3.01	16.46±2.41	22.94±3.65	15.23±3.42	23.50±3.49
No	262	25.10±3.79	16.21±2.68	22.52±3.84	14.61±3.58	22.61±3.92
t/p		2.83/**.005**	0.97/.333	1.13/.259	1.76/.079	2.38/**.018**
Performing self-skin examination						
Yes	127	26.20±3.55	16.15±2.68	22.22±4.09	15.61±3.29	23.76±3.58
No	302	25.18±3.50	16.38±2.53	22.88±3.61	14.54±3.58	22.62±3.81
t/p		2.73/**.007**	-0.84/.404	-1.65/.099	2.89/**.004**	2.90/**.004**
Sunscreen						
Yes	356	25.74±3.22	16.47±2.38	22.97±3.65	14.98±3.52	23.33±3.50
No	73	24.25±4.62	15.55±3.29	21.26±4.01	14.22±3.49	21.15±4.51
t/p		2.63/**.010**	2.27/**.026**	3.59/**<.001**	1.69/.092	3.89/**< .001**

Sd: Standard Deviation; t=student t test; F=One-way ANOVA; $p<0.05$.

In this study, it was found that students who had previously received information about skin cancer had higher perceived susceptibility and self-efficacy scores than students who had not received such information. In the study by Jeihooni and Rakhshani, farmers who received education based on the health belief model showed a significant increase in their knowledge about skin cancer, perceived severity, perceived benefits, perceived susceptibility, and behaviors related to cancer prevention compared to the group that did not receive any intervention, and a significant decrease in perceived barriers.[24] In Doğan and Caydan's study, significant differences were observed in the perceived severity, perceived susceptibility, perceived barriers, perceived benefits, and self-efficacy scores of students who received training on skin cancer through videos.[25] The results of the study support this research. The studies show that students' perceived susceptibility and self-efficacy scores are higher than those of students who did not receive information, demonstrating the effect of health information on protective behaviors. This situation reveals that students' high level of knowledge about skin cancer risk increases both their tendency to perceive themselves as being at risk (perceived susceptibility) and their confidence in their ability to implement protective behaviors (self-efficacy).

In this study, students who performed self-skin examination had higher perceived susceptibility, perceived barriers, and self-efficacy scores than those who did not. A study by Yılmaz et al. found that the majority of nursing students did not know the number of moles on their bodies and did not perform self-examination.[26] In their study, Erkin et al. demonstrated that self-skin examination training had a positive effect on nursing students' knowledge and practice.[27] The above studies are parallel to this study. Individuals who perform skin examinations during their check-ups also have a high awareness of skin cancer. Early diagnosis saves lives. Therefore, it is important to raise awareness among students about self-skin examination

Table 4. Effect of some variables on Health Belief Model Scores in skin cancer.

Model	B	SE	β	t	*p*
Model 1: Perceived susceptibility					
Constant	23.02	0.50	0.00	46.15	<.001
Gender female	1.46	0.51	0.15	2.85	**.005**
Get information about skin cancer-Yes	0.82	0.35	0.11	2.32	**.021**
Self-skin examination-Yes	0.71	0.38	0.09	1.87	.062
Use of sunscreen-Yes	0.79	0.51	0.08	1.55	.122
Skin tone-Fair-skinned	0.13	0.33	0.02	0.40	.691
	F(5;423)=6.539. p<.001. R^2=0.071				
Model 2: Perceived severity					
Constant	14.75	0.37	0.00	40.35	<.001
Gender female	1.21	0.38	0.17	3.20	**.001**
Get information about skin cancer-Yes	0.36	0.26	0.07	1.40	.162
Self-skin examination-Yes	-0.41	0.28	-0.07	-1.47	.141
Use of sunscreen-Yes	0.29	0.37	0.04	0.78	.434
Skin tone-Fair-skinned	0.64	0.25	0.12	2.60	**.010**
	F(5;423)=5.521. p<.001. R^2=0.061				
Model 3: Perceived benefits					
Constant	20.88	0.54	0.00	38.84	<.001
Gender female	0.72	0.55	0.07	1.30	.193
Get information about skin cancer-Yes	0.69	0.38	0.09	1.82	.070
Self-skin examination-Yes	-0.92	0.41	-0.11	-2.26	**.024**
Use of sunscreen-Yes	1.45	0.55	0.14	2.64	**.008**
Skin tone-Fair-skinned	-0.01	0.36	0.002	-0.04	.971
	F(5;423)=4.305. p<.001. R^2=0.048				
Model 4: Perceived barriers					
Constant	13.36	0.51	0.00	26.36	<.001
Gender female	0.71	0.52	0.07	1.36	.173
Get information about skin cancer-Yes	0.40	0.36	0.06	1.12	.264
Self-skin examination-Yes	0.90	0.38	0.12	2.36	**.019**
Use of sunscreen-Yes	0.35	0.52	0.04	0.68	.495
Skin tone-Fair-skinned	0.39	0.34	0.06	1.15	.249
	F(5;423)=3.078. p=.010. R^2=0.035				
Model 5: Self-efficacy					
Constant	20.12	0.53	0.00	37.95	<.001
Gender female	0.87	0.55	0.09	1.59	.112
Get information about skin cancer-Yes	0.73	0.38	0.09	1.95	.052
Self-skin examination-Yes	0.85	0.40	0.10	2.11	**.035**
Use of sunscreen-Yes	1.72	0.54	0.17	3.19	**.002**
Skin tone-Fair-skinned	0.31	0.36	0.04	0.86	.392
	F(5;423)=7.326. p<.001. R^2=0.079				

SE: standard error; β: standardized regression coefficient

In this study, students who used sunscreen had higher scores for perceived susceptibility, perceived severity, perceived benefit, and self-efficacy than students who did not use sunscreen. In the study by Fuentes-Lara et al., it was observed that individuals with high self-efficacy and perceived susceptibility avoided sun exposure and took preventive measures against sun exposure.[28] In another study, individuals with high perceived susceptibility, seriousness, and self-efficacy were found to use protective behaviors more frequently.[29] The results of this study are similar to those of other studies. Individuals with high awareness and perception of skin cancer take more protective measures against sun exposure.

In this study, female students' perceived susceptibility, perceived severity, perceived benefit, and self-efficacy scores were found to be higher than those of male students. In the study by Koçak and Adana, female students were found to have higher rates of sun avoidance and sunscreen use.[12] Haney and colleagues' study also found that female students had higher levels of knowledge about skin cancer and protective behaviors.[30] Literature studies are parallel to this study. This may be because female students pay more attention to their self-care and skin beauty.

The perceived barriers levels of first-year students were found to be higher compared with those of third- and fourth-year students. In contrast, the perceived barriers levels of second-year students were lower than those of third-year students. In a study conducted by Yılmaz and colleagues on first- and fourth-year nursing students, it was determined that first-year students lacked knowledge and behaviors regarding sun protection and had a higher risk of skin cancer.[26] The fact that our study yielded similar results suggests that first-year nursing students have not yet received training on cancer and prevention methods. Phenotypic characteristics such as hair, skin, and eye color are directly related to sensitivity to UV radiation, and people with fair skin tend to freckle or burn easily. Therefore, people with this phenotype are at higher risk.[31] In this study, students with blue/green and hazel eye colors were found to have higher perceived severity scores than students with black eye colors. Fair-skinned students were found to have higher perceived severity scores than brown-skinned students. Individuals with colored eyes and fair skin have a high awareness of skin cancer.

In this study, female students, prior knowledge about skin cancer and having fair skin were found to be significant predictors of the health belief model regarding skin cancer. In a study conducted by Mirzaei-Alavijeh et al. among university students, it was found that female students, mothers with higher education levels, and sunscreen use were significant predictors of the skin cancer health belief model.[32] In other studies, individuals with knowledge about skin cancer and self-efficacy have been found to have high health belief model scores.[28,33] In the studies, knowledge about women's gender and skin cancer is predictive of the health belief model. Findings in the literature support this study.

Limitations

The study was conducted only with students from the Faculty of Health Sciences, Department of Nursing, at a state university in Istanbul. Therefore, the results may not be generalizable to all nursing students in Türkiye. Furthermore, the proportion of variance explained by the regression models was low. Self-skin examination was identified as a negative predictor of the perceived benefits score. These findings indicate the need for further research on this topic.

Conclusion

In this study, students' perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and self-efficacy were found to be at a moderate level. Female gender, prior knowledge about skin cancer, and having fair skin were identified as significant predictors of these health beliefs. Students who had prior knowledge about skin cancer, performed self-skin examinations, used sunscreen, and were female had higher perceived susceptibility and self-efficacy

scores. Students with blue/green and hazel eye color had higher perceived severity scores than students with black eye color. Fair-skinned students had higher perceived severity scores than brown-skinned students.

Based on these results, it is important to plan and implement health education programs aimed at increasing skin cancer awareness among university students. It is recommended that practical training be provided to develop self-efficacy in order to increase sun protection behaviors. In addition, students should be encouraged to develop the habit of regularly performing self-skin examination. Community-based awareness campaigns and sustainable education programs through university health units should be supported, and individuals' knowledge and risk perception regarding skin cancer should be strengthened. Thus, public awareness of skin cancer will be increased by promoting early diagnosis and protective behaviors.

Conflict of Interest

The authors have no conflicts of interest to disclose.

Compliance of Ethical Statement

Verbal and written consent was obtained from participants. Ethical approval for the study was obtained from the Marmara University Faculty of Health Sciences, Non-Interventional Clinical Research Ethics Committee (Approval date and number: 02/27/2025/38). Permission to use the scale in the study was obtained from the author via email. The research complies with the provisions of the Declaration of Helsinki.

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Author Contributions

G.Ç., N.Ö., H.K., B.K.: Hypothesis; G.Ç., N.Ö., H.K., B.K.: Design; G.Ç.: Data collection; G.Ç., N.Ö., H.K., B.K.: Literature review; G.Ç.: Analysis and interpretation of results; G.Ç., N.Ö., H.K., B.K.: Writing; G.Ç., N.Ö., H.K., B.K.: Critical review.

References

1. Khan NH, Mir M, Qian L, et al. Skin cancer biology and barriers to treatment: Recent applications of polymeric micro/nanostructures. *J Adv Res*. 2022;36:223-247. doi:10.1016/j.jare.2021.06.014
2. Abubakar M. Overview of skin cancer and risk factors. *International Journal of General Practice Nursing*. 2024;2(3):42-56.
3. Leiter U, Keim U, Garbe C. Epidemiology of Skin Cancer: Update 2019. In: Reichrath J, ed. *Sunlight, Vitamin D and Skin Cancer*. Springer International Publishing; 2020:123-139.
4. Jones OT, Ranmuthu CKI, Hall PN, Funston G, Walter FM. Recognising Skin Cancer in Primary Care. *Adv Ther*. 2020;37(1):603-616. doi:10.1007/s12325-019-01130-1
5. Ferlay J, Colombet M, Soerjomataram I, et al. Cancer incidence and mortality patterns in Europe: Estimates for 40 countries and 25 major cancers in 2018. *Eur J Cancer*. 2018;103:356-387. doi:10.1016/j.ejca.2018.07.005
6. Alonso-Belmonte C, Montero-Vilchez T, Arias-Santiago S, Buendía-Eisman A. Current State of Skin Cancer Prevention: A Systematic Review. *Actas Dermosifiliogr*. 2022;113(8):T781-T791. doi:10.1016/j.ad.2022.04.018
7. Davids LM, Kleemann B. The Menace of Melanoma: A Photodynamic Approach to Adjunctive Cancer Therapy. In: Guy Huynh Thien D, ed. *Melanoma*. IntechOpen; 2013:Ch. 22.
8. Global Cancer Observatory (GLOBOCAN). https://gco.iarc.who.int/media/globocan/factsheets/populations/900-world-fact-sheet.pdf. 2025. Accessed 26 May 2025,
9. Katkat Çelik E, Baykal Selcuk L, Ersöz Ş, Aksu Arıca D, Yaylı S, Ferhatosmanoğlu A. Trends of skin cancer incidence in Turkey: A hospital-based study. *Turkish Journal of Dermatology*. 2023;17(4). doi:10.4103/tjd.tjd_104_23
10. Guerra KC, Zafar N, Crane JS. Skin Cancer Prevention (Archived). StatPearls [Internet]. https://www.ncbi.nlm.nih.gov/sites/books/NBK519527. Updated Aug 8, 2023
11. Perez M, Abisaad JA, Rojas KD, Marchetti MA, Jaimes N. Skin cancer: Primary, secondary, and tertiary prevention. Part I. *J Am Acad Dermatol*. 2022;87(2):255-268. doi:10.1016/j.jaad.2021.12.066
12. Adana F, Koçak AN. Üniversite Öğrencilerinin Deri Kanseri ve Güneşten Korunma Hakkındaki Bilgi ve Davranış Düzeyleri: Kesitsel Bir Çalışma. The knowledge and behavİor of unİversİty students about skİn cancer and sun protectİon: A cross-sectİonal research. *Journal of Anatolia Nursing and Health Sciences*. 2021;24(4):486-495. doi:10.17049/ataunihem.616340
13. Baghani M, Robati RM, Mozafari N, et al. Knowledge, Attitude, and Practice toward Skin Cancer among Patients of Dermatology Clinics and Medical Students/General Practitioners. *J Skin Cancer*. 2024;2024(1):9081896. doi:10.1155/2024/9081896
14. Aksoy H, Demir Uyan D, Dağcıoğlu K, et al. Fifth and Sixth Grade Medical Faculty Students' Awareness About Melanoma: A Descriptive Study. *Turkish Journal of Family Practice*. 2022;26(1):6-11. doi:10.54308/tahd.2022.29392
15. Dogan ES, Caydam OD. A Scale Development Study: Health Belief Model Scale in Skin Cancer among Turkish University Students. *Saudi J Nurs Health Care*. 2021;4(8):205-213. doi:10.36348/sjnhc.2021.v04i08.001
16. Petitt EK, Taylor RA, Yu X. Use of a Clinic-Based Skin Cancer Prevention Bundle to Promote Sun-Protective Behaviors in Patients at Moderate to High Risk for Skin Cancer. *Journal of the Dermatology Nurses' Association*. 2021;13(1):38-48. doi:10.1097/jdn.0000000000000590
17. Faul F, Erdfelder E, Lang A-G, Buchner A. G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*. 2007;39(2):175-191. doi:10.3758/BF03193146
18. Polit DF, Beck CT. *Nursing research: Generating and assessing evidence for nursing practice*. Lippincott Williams & Wilkins; 2008.
19. Cohen J. *Statistical power analysis for the behavioral sciences*. Routledge; 1988.
20. Dogan ES, Caydam OD. Knowledge, attitudes, and beliefs regarding skin cancer among health sciences students in Turkey: A cross-sectional study. *Sao Paulo Med J*. 2024;142(6):e2024089. doi:10.1590/1516-3180.2024.0089.13052024
21. Nahar VK, Wilkerson AH, Ghafari G, et al. Skin cancer knowledge, attitudes, beliefs, and prevention practices among medical students: A systematic search and literature review. *Int J Womens Dermatol*. 2018/09/01/ 2018;4(3):139-149. doi:10.1016/j.ijwd.2017.10.002
22. Ugurlu Z, Işık SA, Balanuye B, Budak E, Elbaş NÖ, Kav S. Awareness of Skin Cancer, Prevention, and Early Detection among Turkish University Students. *Asia Pac J Oncol Nurs*. 2016/01/01/ 2016;3(1):93-97. doi:10.4103/2347-5625.170969
23. Shelestak D, Lindow K. Beliefs and Practices Regarding Skin Cancer Prevention. *Journal of the Dermatology Nurses' Association*. 2011;3(3):150-155. doi:10.1097/JDN.0b013e31821f3f43
24. Jeihooni AK, Rakhshani T. The Effect of Educational Intervention Based on Health Belief Model and Social Support on Promoting Skin Cancer Preventive Behaviors in a Sample of Iranian Farmers. *J Cancer Educ*. 2019;34(2):392-401. doi:10.1007/s13187-017-1317-1
25. Dogan ES, Caydam OD. Effect of planned visual education on university students' attitudes and beliefs regarding skin cancer: a cluster-randomized controlled trial. *Sao Paulo Med J*. 2025;143(4):e2024252. doi:10.1590/1516-3180.2024.0252.R1.14022025
26. Yılmaz M, Yavuz B, Subasi M, et al. Skin cancer knowledge and sun protection behavior among nursing students. *Jpn J Nurs Sci*. 2015;12(1):69-78. doi:10.1111/jjns.12049
27. Erkin Ö, Aygün Ö. Effects of an Education Intervention on Nursing Students' Knowledge and Attitudes Regarding Skin Self-Examination and Skin Cancer Risks. *J Nurs Res*. 2020;28(1)doi:10.1097/jnr.0000000000000326

28. Fuentes-Lara C, Zeler I, Moreno Á, De Troya-Martín M. Sun behavior: exploring the health belief model on skin cancer prevention in Spain. *Journal of Public Health*. 2024/09/11 2024;doi:10.1007/s10389-024-02335-7
29. Maleki A, Daniali SS, Shahnazi H, Hassanzadeh A. Application of the Protection Motivation Theory (PMT) in Teaching Skin Cancer Prevention Behaviors in Male Students. *J Cancer Educ*. Apr 2023;38(2):497-504. doi:10.1007/s13187-022-02145-z
30. Haney MO, Bahar Z, Beser A, Arkan G, Cengiz B. Psychometric Testing of the Turkish Version of the Skin Cancer and Sun Knowledge Scale in Nursing Students. *J Cancer Educ*. 2018;33(1):21-28. doi:10.1007/s13187-016-1041-2
31. Brokalaki H, Patelarou E, Vardavas C, Elefsiniotis IS, Giakoumidakis KA, Brokalaki E. Current patterns of the sun protection measures adopted by nurses and the risk factors influencing their compliance. *Open Journal of Nursing*. 2011;1(3):43-50. doi:10.4236/ojn.2011.13006
32. Mirzaei-Alavijeh M, Gharibnavaz H, Jalilian F. Skin Cancer Prevention: Psychosocial Predictors of Sunscreen Use in University Students. *J Cancer Educ*. Feb 2020;35(1):187-192. doi:10.1007/s13187-019-01579-2
33. Pearlman RL, Patel V, Davis RE, et al. Effects of health beliefs, social support, and self-efficacy on sun protection behaviors among medical students: testing of an extended health belief model. *Arch Dermatol Res*. Aug 2021;313(6):445-452. doi:10.1007/s00403-020-02123-9