

Original Research Article

The impact of skin cancer education and skin self-examination on mothers' sun protection behaviours: a randomised controlled trial

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ABSTRACT

Background: Skin cancer is a serious disease that is now widespread, affecting many people globally. It has a high mortality rate both worldwide and in Türkiye. This study investigated the effect of educating parents of secondary school students about skin cancer, skin self-examination (SSE), and sun protection behaviors on their children's sun protection behaviors.

Methods: The study was conducted as a randomized controlled experimental study. The study sample consisted of 240 parents. Data were collected using an introductory information form, the skin cancer and sun knowledge scale (SCSKS), and the parental sun protection scale (PSPS).

Results: After training, the number of parents in the experimental group who applied SSE to their children increased to 59.2% ($p < 0.001$). However, this rate was determined as 10.8% in the control group. Significant increases were observed in the total SCSKS score (16.02 ± 3.64) and the sun protection (4.63 ± 1.28), tanning (7.45 ± 1.98), and skin cancer prevention (1.54 ± 0.59) subdimensions in intervention group ($p < 0.001$). After training, a positive and significant difference was observed in the outcome for PSPS self-efficacy subdimension as well as for the sun avoidance scale- product usage expectations subdimension in the experimental group ($p < 0.05$).

Conclusions: There was also an increase in the number of parents performing SSE on their children. Parents have an impact on their children's health. Therefore, educating parents is critical both in terms of their own sun protection behaviors and for those of their children. It is recommended that intervention studies be conducted with larger sample groups.

Keywords: Nursing, Skin cancer, Skin self-examination, Sun protection

INTRODUCTION

Skin cancer is a dangerous disease whose incidence is increasing worldwide, as well as in Türkiye. Melanoma is a rare type of skin cancer that has the highest risk of death.^{1,2} Melanoma accounted for 1.7% of all malignancies observed globally in 2020, with 324,635 new cases reported. According to statistics from GLOBOCAN. Melanoma killed 57,043 people worldwide in 2020.³ According to the Türkiye Cancer Statistics data, 1,756 new cases were diagnosed in 2020, and 888 people died.² In terms of the most recent cancer statistics,

melanoma is among the 10 most common cancers in children aged 0-14 years. This situation is a public health problem in Türkiye and in other countries.²

Early diagnosis and screening tests reduce the risk of death by detecting signs and symptoms of melanoma before it occurs.⁴ Skin self-examination (SSE) involves a comprehensive examination of the body. The whole body is looked at and melanoma symptoms can thus be detected at an early stage.⁵ The International Skin Cancer Foundation recommends that individuals of all ages have regular skin examinations every month.⁶ It is beneficial

for every individual to know and apply SSE, especially from an early age. However, children may not be able to fully assess their own bodies, and may not be able to perform detailed examinations. Parents should support their children in this regard.⁷

Investigating the causes of the increase in melanoma, it is clear that environmental and genetic factors both play a part. Genetic factors are having blonde hair, the colour of the eyes and skin, having a large number of freckles and moles, the presence of abnormal moles and a history of cancer.⁴ While melanoma can affect anybody, the risk is higher in those with fairer skin, particularly in those with red or blond hair, blue or green eyes, freckles, or easily burned skin. The skin cancer association has announced that one in every 10 patients diagnosed with skin cancer has a family member with this disease.⁵ The environmental risk factor for skin cancer is ultraviolet radiation (UVR). The main source of UV rays is the sun, which reach the earth in an unmediated form. The increase in skin cancers in recent years has been associated with increased exposure to sunlight.⁴

During childhood, melanin pigment synthesis is fairly modest. As a result, children are more vulnerable to the detrimental effects of sunshine, and early exposure to sunlight plays a crucial role in the development of skin cancer later in life.^{7,8} Several descriptive studies in the literature have investigated skin cancer, SSE, and sun protection behaviours among adolescents and students. Haney et al, in a study with nursing students, found that female students had more knowledge about skin cancer and engaged in more protective behaviours than male students. They suggested that training programs on the subject be developed.⁹ Patel et al, in a study on the sun protection behaviours of children and adolescents in the USA, found that gender, age, geographical location and phenotypic characteristics led to differences in sun protection attitudes and behaviours. They suggested that these features should be taken into account in planned intervention studies.⁷ According to Holman et al, the incidence of cancer among adults in the United States will likely drop over the next decade as a result of limiting individuals' exposure to UV radiation.¹⁰ Altunkurek and Kaya, in a study with parents, found that more than half of parents did not know about skin cancer or SSE and did not examine their children's skin.¹¹ In this context, it is critical to increase parental knowledge of sun protection behaviours, since the parents are their children's primary role models, to design training to develop these behaviours, and to ensure that their children know how to protect themselves from the sun. Research with parents on this topic is scarce in Türkiye, and no experimental studies have been discovered.

The aim of this study was thus to investigate the awareness of parents of secondary school students (aged 10-14) regarding skin cancer and SSE, and the influence of training about skin cancer and SSE given to parents on their children's sun protection behaviours.

METHODS

Study design

This research was a randomized controlled trial. The CONSORT guide was used as a basis in writing the study and it was written according to the guide.¹² Pre-test and post-test were employed in the study's two groups, the experimental and control group.

Participants

Parents of students studying at Yalçın Eskiyaan Secondary School and Hacı Mustafa Tarman Secondary School between January and May 2021 participated in the research. Parents who met the inclusion criteria and agreed to participate in the study were included.

Inclusion criteria

The inclusion criteria were speaking Turkish as the mother tongue, being literate, having no communication problems (hearing, seeing or understanding), agreeing to participate in the research, being a mother/father with a child between the ages of 10-14, being able to connect to the internet and communicate via smartphone, tablet, computer etc.

Exclusion criteria

The exclusion criteria were being in a situation that would prevent written and verbal communication and not having children between the ages of 10-14.

Sample and setting

The population of this study consisted of Yalçın Eskiyaan Secondary School and Hacı Mustafa Tarman Secondary School in Keçiören, Ankara, which have similar sociodemographic characteristics and do not have a school health nurse. There are n=2349 students enrolled in these two schools. However, the target group of the study was parents. One parent of each selected student was included in the sample.

Previous studies on the subject were examined and the effect size was calculated by taking into account the results presented in the article titled "nursing student's awareness on skin cancer" in sample volume calculations.¹³ As a result of the calculations, the sample size that would provide the power of the test $[(1-\beta) = 0.80]$ was determined to be a minimum of 238 people, 119 people in the experimental and control groups ($\alpha=0.05$, $\beta=0.80$, effect size= 0.325). Therefore, it was planned that the sample of the study would be 240 people (Figure 1). In the post-hoc power analysis performed using G*Power version 3.1.9.7, the power of the study after the study was found to be 0.92.

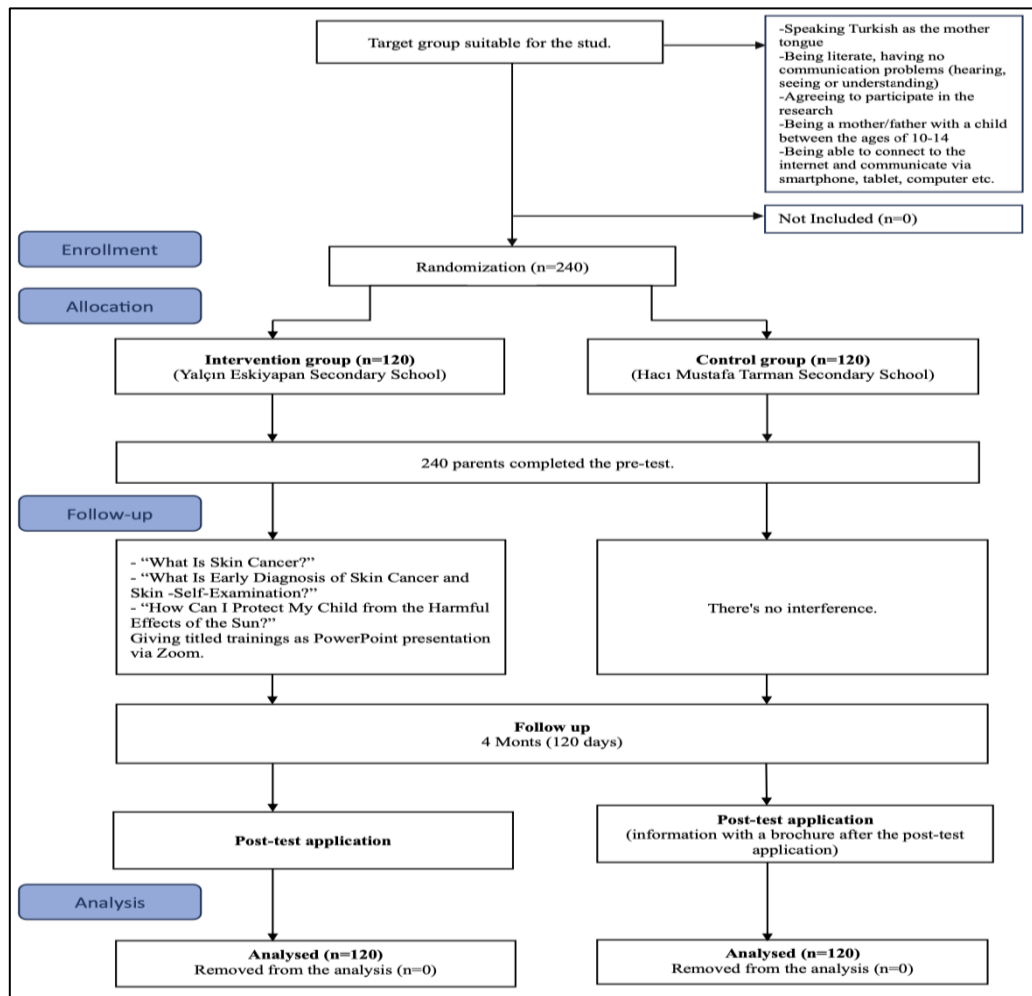


Figure 1: Intervention and control group consort (2017) flow chart of the study.

Randomization and blinding

Randomization was used in the study to establish which schools would comprise the experimental and control groups. Schools were randomized in order to prevent the groups from being affected by the interventions. The schools were divided into the experimental group (intervention group) and the control group by the closed-envelope method. Yalçın Eskiyaşan Secondary School was assigned to the experimental group, while Hacı Mustafa Tarman Secondary School was assigned to the control group. During the acceptance of the participants to the study or during the intervention, the participants were not informed that there were two different groups in the study, and which group the participant was in. Single blind technique was used in the study. In determining the students to be included in the research, student lists and MS Excel 2016 were used, and simple random sampling was conducted. The student lists assigned to the groups by the expert were sent to the researcher before the initiatives started. It was planned to include one parent of each student in the study. The investigator evaluating the outcomes was blinded in determining the groups.

Education program

Education for the experimental group was given through a PowerPoint presentation with the titles “what is skin cancer?”, “What is early diagnosis of skin cancer and skin self-examination?” and “How can I protect my child from the harmful effects of the sun?” The content of the training was prepared in line with a literature review and after obtaining expert opinion.^{10,14-16} The training was given online via Zoom to five groups of 20-25 people each by the researcher. The researchers were an associate professor, a lecture and a research assistant, and were experts in the field of providing training. The duration of the training session was approximately 40-45 minutes. The methods used included lecture, question-and-answer and brainstorming. The training consisted of the PowerPoint presentation, while a coloured brochure was used to order to reinforce the information after the training. This brochure was sent to the parents via a WhatsApp group and included the topics “What is skin cancer?”, “What are the causes and symptoms of skin cancer?”, “SSE and the steps to take” and “sun protection behaviours”. Follow-up was conducted four months (120 days) after the training had been provided.

Intervention group, parents were reached through the director of the Yalçın Eskiyan Secondary School. Pre-test questionnaires were prepared and sent to the parents via a Google forms questionnaire, which included the necessary explanations. Further information was provided and the informed consent form was also sent to the parents. Parents who agreed to participate in the study were able to see the survey questions after giving their consent. Data collection took approximately 20-25 minutes. After the pre-test, the parents in the intervention group were given training on skin cancer, SSE and sun protection behaviours through the PowerPoint presentation. The follow-up period was four months (120 days).

Control group, parents were reached through the principal of Hacı Mustafa Tarman Secondary School. Pre-test questionnaires were prepared and sent to the parents as a Google forms, which included the necessary explanations. Parents who agreed to participate in the study were able to see the survey questions after giving their consent. Data collection took approximately 20-25 minutes. No intervention was made in the control group during the follow-up period. At the end of the follow-up period (120 days), the post-tests [skin cancer and SSE awareness status, introductory information form containing the SSE information form, the skin cancer and sun knowledge scale (SCSKS) and the parent sun protection scale (PSPS)] were sent to the intervention and control groups via a Google forms questionnaire that was distributed by the school principal. A sample of the informed consent form was sent to the participants reminding them of the purpose of the research. Parents who agreed to participate were able to see the post-test questionnaires. Filling out the questionnaires took approximately 20-25 minutes. Immediately after the completion of the post-tests, the educational brochure prepared for the intervention-group parents was sent to the control-group parents in their WhatsApp groups through the school principal in line with the principle of equality.

Measures

Introductory information form

The researchers developed data collection techniques after reviewing the literature on the topic.^{10,16-19} The introductory information form, which was designed to collect sociodemographic data, contained six questions about the parents: their age, marriage status, education level, economic status, number of children. There were three questions about the child, including the child's gender, the child's age and the child's grade. The form also included three questions regarding parents' awareness of skin cancer, its early diagnosis and examination of the child (headed "about skin cancer and SSE", "detecting skin cancer at an early stage" and "examining your child" respectively) for a total of 12 questions.

Skin cancer and sun knowledge scale

The skin cancer and sun knowledge scale (SCSKS), created by Day et al, includes 25 questions that measure individuals' knowledge about skin cancer and sun health.²⁰ The scale measures adults' knowledge in five areas: sun protection (items 1 and 16-22), tanning (items 2-12), skin cancer risk factors (items 13-14 and 23), skin cancer prevention (items 15 and 24), and skin cancer symptoms (item 25). The sum of the components yields a total score ranging from 0 to 25 points. Haney et al assessed the scale's validity and reliability in the Turkish environment. The validity index (CGI) of the SCSKS was 93.71%, the internal consistency reliability coefficient (KR-20) was 0.51, and the test-retest reliability was 0.52 (n=34), $p<0.001$. The discriminant validity of the scale was evaluated with a single-item question, and its discriminant validity was confirmed ($p<0.001$).⁹ The Cronbach's alpha values for this study were as follows: 0.55 for the pre-test and 0.66 for the post-test.

Parental sun protection scale

The parental sun protection scale (PSPS), developed by Tripp et al, is made up of two models, each with 18 items: (a) sunscreen use and (b) sun avoidance. Each scale model has four behaviours: self-efficacy, norms/attitudes, expectation, and barriers.²¹

The sunscreen use model comprises five items for assessing sunscreen-use self-efficacy, six items for norms/attitudes towards sunscreen use, four items for sunscreen-use expectations, and three items for barriers to sunscreen use. In the sun avoidance model, there are five items for assessing sun-avoidance self-efficacy, four items for norms/attitudes towards sun avoidance, four items for tanning expectancies, and five items for sun avoidance expectations. Each item on the scale models is graded from 1 to 5. Each subscale of the scales is examined independently. The sunscreen-use self-efficacy, norms/ attitudes about sunscreen use, sunscreen-use expectations, sun-avoidance self-efficacy, norms/attitudes about sun avoidance, and sun avoidance expectations subscales are expected to produce high scores in the evaluation; however, the barriers to sunscreen use and tanning expectations subscales are expected to produce low score. Sümen and Öncel conducted a validity and reliability study of the Turkish version of the PSPS, and Cronbach's alpha was determined to be 0.84 for both models.²² The Cronbach's alpha values for this study were as follows: 0.80 for sunscreen use and 0.82 for sun avoidance.

Data analysis

The data obtained in the study were evaluated with the Statistical Package for Social Sciences (SPSS Inc. Chicago, USA) 25.0 statistical analysis program for Windows. The Kolmogorov-Smirnov test was used to examine the conformity of the data to the normal

distribution. In the evaluation of data, descriptive statistics were used for continuous data, while mean, standard deviation, median, minimum, maximum values and numbers and percentages were used for discrete data. The Chi-square test was used to compare the descriptive characteristics of parents and their children in the intervention and control groups, and to compare the skin cancer and SSE knowledge status of the parents in the intervention and control groups. The Wilcoxon test was used to compare the pre-test and post-test scores of the intervention and control groups. The Mann-Whitney U test was used to compare the scale scores with the two-group independent variables. The t-test was used to compare the normally distributed continuous data in two groups. Chi-square and Fisher's Exact tests were used for group comparisons (cross tables) of nominal variables.

$P < 0.05$ was accepted as the statistical significance limit. Values less or equal to this were considered statistically significant, while larger values were not statistically significant.

RESULTS

Findings on descriptive characteristics of parents and children

The research included 240 parents: 120 in the control group and 120 in the intervention group. The parents'

average age was 40.75.3 years, with a range of 29 to 57 years. The children's average age was 11.741 years. Of the parents taking part in the study, 90% were mothers, 48.8% were between the ages of 30 and 40, 86.3% were married, 45.4% had a high school diploma, and 60.8% had a bachelor's degree. Their financial situation is determined by their income and expenditure, and 58.3% of them had two children (Table 1).

In Table 2, the knowledge levels of the parents about skin cancer and SSE were analysed and it was determined that the number of parents who answered "I have enough knowledge" was low in the intervention group (18.3%) and the control group (13.3%) in the pre-test and no statistically significant difference was found between them ($p=0.494$). In the post-test, this rate increased to 51.7% in the intervention group, and it was found to be statistically significant between the control group ($p < 0.001$). In the pretest of the study, there was no statistically significant difference between the intervention group (45%) and the control group (39.2%) who answered "yes" to the detection of skin cancer at an early stage ($p=0.595$). In the post-test of the study, the number of parents who answered "yes" to the detection of skin cancer at an early stage was statistically significantly higher in the intervention group (85.8%) than in the control group (39.2%) ($p < 0.001$) (Table 2).

Table 1: Comparison of descriptive features of intervention and control group parents and children (n=240).

Descriptive Features	Categories	Intervention (n=120)		Control (n=120)		Total (n=240)		Statistics	
		N	%	N	%	N	%	χ^2*	P value
Parents	Mother	106	88.3	110	91.7	216	90.0	0.741	0.389
	Father	14	11.7	10	8.3	24	10.0		
Parents age	<30	0	0.0	1	0.8	1	0.4	5.229	0.103
	30-40	52	43.3	65	54.2	117	48.8		
	41-50	66	55.0	50	41.7	116	48.3		
	>50	2	1.7	4	3.3	6	2.5		
Marital status	Married	99	82.5	108	90	207	86.2	2.846	0.092
	Single	21	17.5	12	10	33	13.8		
Educational Status	Primary school	11	9.2	11	9.2	22	9.2	1.600	0.656
	Secondary School	4	3.3	8	6.7	12	5.0		
	High school	54	45.0	55	45.8	109	45.4		
	Undergraduate /postgraduate	51	42.5	46	38.3	97	40.4		
Economic Situation	Income less than expenses	33	27.5	34	28.3	67	27.9	1.187	0.552
	Income equals expense	76	63.3	70	58.3	146	60.8		
	Income more than expenses	11	9.2	16	13.4	27	11.3		
Number of children	Only child	18	15.0	15	12.5	33	13.8	0.402	0.818
	Two kids	68	56.7	72	60.0	140	58.3		
	Three children and above	34	28.3	33	27.5	67	27.9		

Continued.

Descriptive Features	Categories	Intervention (n=120)		Control (n=120)		Total (n=240)		Statistics	
		N	%	N	%	N	%	χ^{2*}	P value
Child gender	Girl	53	44.2	68	56.6	114	47.5	1.069	0.301
	Boy	67	55.8	52	43.4	126	52.5		
Child age	10	15	12.5	16	13.3	31	12.9	8.023	0.091
	11	30	25.0	46	38.3	76	31.7		
	12	37	30.8	30	25.0	67	27.9		
	13	34	28.3	21	17.5	55	22.9		
	14	4	3.4	7	5.9	11	4.6		
Child's class	5 th grade	37	30.8	42	35.0	79	32.9	4.558	0.207
	6 th grade	28	23.3	38	31.7	66	27.5		
	7 th grade	35	29.2	23	19.2	58	24.2		
	8 th grade	20	16.7	17	14.1	37	15.4		
Total		120	100	120	100	240	100		

* Chi-square test.

Table 2: Comparison of skin cancer and early diagnostic knowledge status of parents in the intervention and control groups based on pre-test and post-test findings (n=240).

Variables	Categories	Pre-test				Post-test							
		Intervention (n=120)		Control (n=120)		Statistics		Interventio n (n=120)		Control (n=120)		Statistics	
		N	%	N	%	χ^2*	P value	N	%	N	%	χ^2*	P value
About skin cancer and SSE	I don't know	36	30.0	42	35.0	1.409	0.494	5	4.1	48	40.0	73.001	<0.001
	I heard but I don't know exactly	62	51.7	62	51.7			53	44.2	62	51.7		
	I have enough knowledge	22	18.3	16	13.3			62	51.7	10	8.3		
Detecting skin cancer at an early stage	No idea	63	52.5	71	59.2	1.227	0.595	11	9.2	68	56.7	62.124	<0.001
	Impossible	3	2.5	2	1.6			6	5.0	5	4.2		
	Yes	54	45.0	47	39.2			103	85.8	47	39.2		
The situation of making SSE to your child	Yes	24	20.0	15	12.5	2.480	0.115	71	59.2	13	10.8	61.612	<0.001
	No	96	80.0	105	87.5			49	40.8	107	89.2		

* Chi-square/Fisher's Exact test.

Based on the pre-test and post-test findings, the status of SSE among the intervention and control group parents was compared. The pre-test was completed by 24 people in the intervention group and the post-test was completed by 71 people. It was found that there was an increase in the number of parents who practiced SSE and that the training provided was effective. However, in the control group, while this rate was 87.5% in the pre-test, it was 89.2% in the post-test and almost unchanged (Table 2).

Findings regarding parents' SCSKS scores

The comparison of the SCSKS scale and its sub-dimensions between the intervention and control groups

is given in Table 3. In the pre-test phase of the study, no statistically significant difference was found between the intervention and control groups in terms of scale sub-dimensions and total score ($p>0.05$). However, when the intervention group and the control group were compared in the post-test phase of the study, the mean scores of "sun protection", "tanning" and "prevention of skin cancer" sub-dimensions increased in the experimental group and a statistically significant difference was found between the two groups ($p<0.05$). The mean score of the parents in the intervention group (16.02 ± 3.64) was statistically significant and higher than the control group (13.99 ± 2.88) ($p<0.001$) (Table 3).

Table 3: Comparison of intervention and control group parents' SCSKS scores between groups according to pretest-post-test results (n=240).

SCSKS Sub-Dimensions	Pre-test		Post-test					
	Intervention (n=120)	Control (n=120)	Statistics		Intervention (n=120)	Control (n=120)	Statistics	
	Ort±SS median (min-max)	Ort±SS median (min-max)	U/ χ^2 *	P value	Ort±SS median (min-max)	Ort±SS median (min-max)	U/ χ^2 *	P value
Sun protection	4.03±1.25 4 (1-7)	3.77±1.23 4 (1-7)	6390.5	0.121	4.63±1.28 4 (2-7)	3.76±1.07 4 (1-6)	4591.0	0.001
Tanning	7.26±1.81 8 (1-11)	7.16±1.69 7 (2-11)	6880.0	0.546	7.45±1.98 7 (1-11)	6.74±1.84 7 (1-11)	6095.5	0.047
Skin cancer risk factors	1.98±0.89 2 (0-3)	1.93±0.85 2 (0-3)	6932.0	0.596	1.97±0.85 2 (0-3)	1.88±0.83 2 (0-3)	6687.5	0.369
Prevention of skin cancer	1.13±0.46 1 (0-2)	1.07±0.32 1 (0-2)	-0.6769	0.220	1.54±0.59 2 (0-2)	1.09±0.48 1 (0-2)	4192.0	0.001
Skin cancer symptoms	1 (0-1)	1 (0-1)	$\chi^2=0.423$	0.515	1 (0-1)	1 (0-1)	$\chi^2=3.068$	0.080
SCSKS Total score	15.00±2.99 15 (5-22)	14.49±2.85 14 (6-21)	6458.0	0.165	16.02±3.64 16 (8-24)	13.99±2.88 14 (7-22)	4809.0	0.001

*U= Mann Whitney U test, χ^2 = chi-square test

Findings related to parental sun protection scale scores (PSPS) of parents

In the pre-test phase of the study, no significant difference was found when the PSPS scale sub-dimensions were compared between the experimental and control groups ($p>0.05$). In the post-test phase of the research, when the parents of the intervention (18.23 ± 5.14) and control groups (16.47 ± 4.96) were compared, the mean scores of the “sunscreen product use scale, self-efficacy” sub-dimension were found to be significant and high ($p<0.05$) (Table 4). A statistically significant difference was found when the mean scores of the “sun avoidance scale, product usage expectations” sub-dimension of the parents in the intervention and control groups were compared ($p<0.05$) (Table 4).

DISCUSSION

The study sought to ascertain the degree of awareness of parents of secondary school students about skin cancer and SSE, as well as the influence of education on skin cancer and SSE on their children's sun protection behaviours. When the knowledge of the parents was assessed in the pre-test of our study, it was established that 18.3% of the parents in the intervention group and 13.3% of the parents in the control group had sufficient information about skin cancer and SSE. After the training, half of the intervention group parents (51.7%) indicated that their understanding about skin cancer and SSE was sufficient. This percentage remained at 8.3% among parents in the control group. This demonstrates the efficacy of the experimental group's training. When the literature on skin cancer knowledge is analysed, one study found that Irish nursing and agriculture students had a

higher knowledge of skin cancer following intervention.²³ In addition, Erkin et al demonstrated that skin cancer education for nursing students enhanced the group's awareness of skin cancer after the intervention, their level of knowledge about how to determine symptoms increased, and the intervention helped them to learn about SSE.¹⁸ Hubbard et al, in their quasi-experimental study conducted in England with students in the 15-16 age group, discovered that after an intervention, the skin cancer awareness of the adolescents in the education group increased and there was a significant increase in those who talked about skin cancer.^{18,24} In their study of nursing students, Yilmaz et al discovered that more than half of first-year students were unaware of skin cancer. Studies in the literature back up our findings.²⁵ Training programs designed to improve awareness of skin cancer and enlighten people about it are successful.

The rate of knowing and performing SSE after training was statistically significant and high in our study. In the pre-test, 20% of parents in the intervention group gave their children SSE, but this percentage climbed to 59.2% in the post-test. Similar to our study, Hubbard et al in the UK discovered, in their quasi-experimental study with students aged 15-16, that teenagers in the education group improved favourably after the intervention compared to the control group.²⁴ In Erkin's thesis study, the rate of SSE performed in the intervention group rose after teenagers were taught about sun rays, tanning, and SSE.¹⁸ Gavin et al discovered that practically all of the participants in their survey of the general public in Northern Ireland had heard about skin cancer previously, but the number of those who practiced SSE was relatively minimal.²⁶ Balyaci et al demonstrated that their quasi-experimental intervention studies with secondary school

pupils increased their SSE behaviour following training.¹⁸ Training provided in experimental investigations on SSE was beneficial and resulted in an increase in the number of SSEs performed.²⁷ Our study findings are consistent with the literature: organized training on skin cancer information have improved SSE practices. It is possible that health education, including providing parents with information about skin cancer, will be successful in instilling in their children the need to practice SSE and sun protection behaviours.

In the present study, the intervention group's SCSKS mean scores rose after training compared to the pre-test mean scores. Following the parent education, there was an increase in the intervention-group parents' understanding of skin cancer and sun health. The intervention group's knowledge levels were found to be much greater than the control group's. When the scores of the sub-dimensions of the groups after training were compared, the intervention group's mean scores for the sun protection sub-dimension and the prevention of skin cancer sub-dimension were significantly higher than those of the control group. These findings demonstrate that the skin cancer and sun education training is beneficial. When the literature is investigated, a small number of intervention studies utilizing SCSKS are found, but there are more descriptive studies overall. According to Koçak and Adana's research, university students had a good level of understanding about skin cancer and sun exposure. The sub-dimension scores of the scale were found to be higher than in our study, and the sub-dimensions of sun protection and skin cancer prevention were shown to be significant depending on the gender of the students.²⁷ According to Sümen and Öncel, nursing students' knowledge of skin cancer and the sun was low, but kindergarten teachers' knowledge of skin cancer and the sun was moderate.¹⁴ Nurses who received skin cancer training had higher SCCS scores than others, according to Day et al, Altunkürek and Kaya stated that knowledge of skin cancer and sun health was not sufficient based on the parents' SCSKS scores.^{11,13,14,28,29} It was also recommended that further intervention studies are needed in the literature.^{11,28} Our research demonstrated findings comparable to those in the literature. More intervention studies on this topic are clearly required, as is the use of "reminders" communicated via video, photos, messages, instructive cartoons, etc. at specific weeks during the follow-up process to make the training more successful in future research.

Sunscreen usage is a sun protective behaviour that reduces the risk of skin cancer. Parents should apply sunscreen to their children on a regular basis, especially during the summer and in tourist regions.³⁰ The intervention group's sunscreen product use scale self-efficacy sub-dimension score increased after the training, and a significant difference was detected between the intervention-group parents and the control-group parents. Only a small number of studies on this topic have been

undertaken with parents. Thoonen et al discovered that self-efficacy had an effect in parents adopting sun protection behaviours for their children, and they emphasized enhancing parental self-efficacy.³¹ Similar to our study, Sümen and Öncel found that, after training, the average sunscreen product use scale self-efficacy score of the parents in the intervention groups increased and there was a significant difference between them and the control group.¹⁷

In all these cases, the instruction provided about skin cancer and sun protection behaviours was beneficial for the intervention-group parents. In some of the studies, sun protection behaviours were substantially improved after the interventions; however, in others, the behaviours improved but not significantly. In the present study, the parents were found to be more successful in their sun protection behaviours, but the expected impact was not observed. This situation is assumed to be influenced by changes in the duration, quality, and follow-up time of the training offered.

This study has some limitations. Due to the COVID-19 epidemic, the training sessions in this study were performed online rather than face-to-face, which was one of the study's limitations. It would be more useful to deliver face-to-face training as well in order to boost its effect and impact. The data in the study are based on the participants' own statements.

CONCLUSION

In the present study, parents who received information about skin cancer were more likely to protect their children from the sun. This indicates that parents should receive training about skin cancer, its early detection, SSE, and sun protection behaviours. Health education for parents has an influence on the health of their children. Informing parents, who are the key role models for children, about how to practice sun protective behaviours creates an example for their children to follow. The intervention-group parents' awareness about skin cancer, SSE, and sun protection behaviours improved as a result of the information provided. The number of parents who used SSE on their children and taught them sun protection behaviours grew, and the education imparted was successful. Secondary school children devote too much time to school and their social lives, and do not, in general, engage in proper health protective behaviours. As a result, educating parents is critical in safeguarding both their own and their children's health. It is important to conduct further descriptive research to identify parents' awareness of skin cancer, SSE, and sun protection behaviours in order to minimise gaps in their knowledge and carry out further intervention studies. In addition, larger sample groups should be used in any future experimental research.

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