RESEARCH ARTICLE

Training Program to Raise Consciousness Among Adolescents for Protection Against Skin Cancer through Performance of Skin Self Examination

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Abstract

Background: Overexposure to sunlight in childhood and the adolescent period and associsated sunburns significantly increase the risk of skin cancer in adulthood. In Turkey, the incidence of skin cancer in the general population is 0.8%. The incidence is 0.6% and the mortality rate is 0.4% for men, while these rates are 1.0% and 0.7%, respectively, for women. If skin cancer is found early, its treatment is facilitated. Therefore, personal skin examination is important for early diagnosis. Objectives: Our aim was to determine the effects of training for raising consciousness among adolescents to protect against skin cancer by influencing skin self examination behavior. Method: This quasi experimental intervention study was conducted between February and April 2012 in Izmir. The study population consisted of students attending 6th, 7th and 8th classes of a primary school (n:302). No sampling was performed. Data were collected with a form developed by the researchers based on the literature. The first part of form is aimed to determine demographic characteristics of adolescents (3 questions) and their risk status of skin cancer (6 questions). The second part was prepared for skin cancer risks of adolescents (8 questions) and indications of skin cancer (12 questions). The last part was intended to determine their knowledge about skin self examination (4 questions) and behavioral stages of skin self examination (1 question). Data collection was achieved with a questionnaire form in three phases. In the 1st phase, data about demographic characteristics of students, risk status of skin cancer, knowledge level of skin cancer and behavior stages were collected. In the 2nd phase, skin self examination training based on the transtheoretical model was performed within the same day just after obtaining preliminary data. In the 3rd phase, adolescents were followed up three times to establish the efficacy of the training (on the 15th day after training program and at end of the 1st and 2nd months). Follow-up data were evaluated by questioning skin self examination performing behavior stages through electronic mail. Results: Half of the adolescents (50.5%) are male, and 58.4% of them are 13 years old with a mean age of 12±1.15 years. About 29.4% of adolescents had brown hair color, 37.9% had brown/hazel eye color, 29.4% had white skin, and 47.2% had fewer than 10 moles in their body. The pretest mean score on knowledge level about risks of skin cancer was found to be 4.19±1.96, while the post-test mean score was 6.79±1.67 (min:0, max:8).The pretest mean score about indications of skin cancer was 7.45±3.76, while the post-test mean score was 10.7±2.60 (min:0, max:12). The increases were statistically significant (p<0.05). The behavior "I do not perform skin self examination regularly in every month and I do not think to perform it in the next 6 months" was reduced from 52.8 to 35.5% after training. Conclusion: The training program organized to raise consciousness among adolescents for protection against skin cancer increased the knowledge level about risks and indications of skin cancer and it also improved the behavior of performing skin self examination.

Keywords: Adolescent - skin cancer - skin self examination - Turkey

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Introduction

Overexposure to sunlight in childhood and adolescent period and sunburns occurring during these periods significantly increase the risk of skin cancer in adulthood (Emmons et al., 2008; Cassel, 2010; Feher et al., 2010; Walker, 2012). Especially, sporadic exposure to sunlight in childhood and adolescence period to cause sunburn increases the risk of melanoma (Boyett et al., 2002; Lowe et al., 2002). Children spend most of their time outdoors, in school and open spaces to make other activities (game, sport etc.). Therefore, it is quite important for school-age children and adolescents to protect against solar beams (Uysal et al., 2004). Melanoma development risk in subsequent periods of life is twice higher in individuals with blistering sunburn history in childhood than other

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individuals with no sunburn history (Mc Whirter et al., 2000; Cokkinides et al., 2002; Maguire-Eisen et al., 2005). Childhood and adolescence are the most critical periods for development of melanoma and other skin cancer types because around 25% of lifelong exposure to sun occurs before 18 years of age (Dietrich et al., 1998; Saraiya et al., 2004; Reinau et al., 2012; Suppa et al., 2012).

The incidence of skin cancer is reported to gradually increase in such countries as Australia, New Zealand and United States of America (USA) (James et al., 2002; Cassel, 2010). According to 2005 data of The Directorate of Fight against Cancer, Ministry of Health of Turkey, the incidence of skin cancer was reported as 18.91 per 100.000 in Turkey. With this rate, skin cancer is among the 10 most frequent cancer types in Turkey (Ministry of Health, 2009). The incidence of skin cancer among general population is 0.8% in Turkey. The incidence is 0.6% in men and mortality rate is 0.4%, while these rates are 1.0% and 0.7% in women (Globocan 2008). There is a risk of skin cancer for everyone; however, people with light skin, multiple moles and stains, overexposure to sun and history of sunburn are under higher risk of skin cancer (Baum and Cohen 1998; Cokkinides et al., 2002; Emmons et al., 2008; Feher et al., 2010; Heckman and Coups 2011). Due to the strong relationship between sunburns in childhood and skin cancer, 80% of all skin cancer cases can be prevented with suitable protective measures (Boyett et al., 2002; Baz et al., 2003; Balk, 2011). The previous studies have reported that protective behaviors performed before 20 years of age make positive contribution to protection from skin cancer (Davis et al., 2002; Glanz et al., 2002). Solar ultraviolet radiation plays a significant role in the epidemiology of skin cancer. Therefore, skin cancer is seen in body parts most exposed to sun like head, neck and hands (Hossfeld et al., 1992; Gökalp and Özgöztaşı, 2005; Ülkür et al., 2005; Uslu et al., 2006; Ergül and Özeren, 2011).

Spring and summer months are periods when children spend most of their times playing outside especially in west, south and southeast regions. Due to sun's perpendicular rays during these periods, exposure to ultraviolet radiation and resulting harmful effects to health increase. As harmful effects of sun exposure increase with the deterioration of ozone layer, it becomes even more important to take protective measures against harmful effects of sunbeams (Uysal et al., 2004). In a study conducted in USA, it is reported that only 10.2% of 11-13 years old children regularly use sun protection cream, while one third of them do not use sun cream at all. In addition, among the children's applications of sun protection, wearing sunglasses is the most common, while wearing hat or protective clothes are less frequent (Cokkinides et al., 2001). Maguire-Eisen et al. (2005) reported that less than one third of children regularly use sun protection cream, hat and sunglasses and they also do not avoid staying under sun at noon hours (Maguire-Eisen et al., 2005). In the study of Feher et al. (2010), it was determined that children between 5 and 12 years of age have higher rates of sun protection applications. And it is reported that 90% of children use sun cream, 75% wear protective clothes, 63% wear hat, and 50% use sunglasses (Feher et al., 2010).

In the present study, SSE behavior of adolescents was evaluated based on transtheoretical model. Transtheoretical model (TM) is frequently used in the investigation of behavioral changes. Prochaska et al. started to study on TM including behavioral change in 1970s and as a result of 12-year study period, they defined it. This model is peculiar in that it was developed based on many other theories like psychoanalytic, humanistic and behavioral sciences (Prochaska and Velicer, 1997). TM was initially started to be used in smoking cessation programs, and it was later used in health promotion programs (like overeating and weight control, exercise, coping with stress etc.). The model focuses on the recognition of change process by individuals to help them voluntarily make changes in behaviors. It guides the health promotion programs organized for people to change undesired behaviors harmful to health or acquire the desired healthy behaviors (Xiao et al., 2004). In a study investigating adolescent's sun protective behaviors by TM, the following behaviors including wearing sun protective clothes, avoiding staying under sun between 11 a.m. and 3 p.m., staying in shadowed areas, using sun protective cream, and abandoning sunbathing were evaluated. According to this study, adolescents demonstrated advancement from not thinking sun protective behaviors to thinking phase of such behaviors and also their consciousness level was found to increase (Kristja´nsson et al., 2003).

The purpose of school health services is to allow school-age children in the society to acquire the optimum mental and social health levels. School nursing is an important service field of public health nurses in the world. The sun protective measures are inadequate in most of schools in USA (Maguire-Eisen et al., 2005). School health nurses could enable children to take protective measures for reducing the risks of skin cancer. Nurses could play a significant role for children and their families to protect from skin cancer and define the relevant risks with the help of inexpensive training materials. School health nurses have many opportunities to help children protect from skin cancer. For instance, they could organize health promotion activities in schools, provide alternative activities to outdoor activities during periods of intensive ultraviolet (UV) rays, develop sun protection programs for school children, work on legal amendments for children to use personal health protective measures like wearing hat, sunglasses, and protective creams, and they could also distribute age-appropriate skin protection materials. Nurses are in touch with children and their families and they could play an active role in changing sun protection behaviors (Walker, 2012).

As part of the project of European Network of Health Promoting Schools, Ministry of Health of Turkey has conducted studies within the scope of "Safe School Program" in the recent years (Ministry of Health, 2008). Nurses assume important roles in health promotion and protection as part of school health services and they also play significant roles in early diagnosis and prevention of skin cancer. Skin cancer is easy to treat with early diagnosis. Therefore, early diagnosis and treatment gain more importance with skin self examination (SSE)

(http://www.skincancer.org). School-age children and adolescents are easy to reach in terms of training in school. This could be turned into an opportunity by school health nurse and could become an important application for health protection services. This study was conducted based on the question "Does a training program for raising consciousness about skin cancer develop the behavior of SSE among adolescents?", and it was aimed to investigate the effects of consciousness raising training for protection from skin cancer among adolescents on behaviors of SSE.

Materials and Methods

Type of Study

Intervention study planned as a quasi experimental with one single group in pretest-posttest design. The study was carried out in a primary school in Izmir/Turkey between February and April 2012.

Study Sample

Study population consisted of students attending the 6th, 7th and 8th classes of a primary school. No sampling was performed, all the adolescents were included. The study was conducted on 214 voluntary adolescents with 70.8% of participation rate.

Data Collection Tools

Data were collected with a form developed by the researchers based on the literature. The first part of form aimed to determine demographic characteristics of adolescents (3 questions) and their risk status of skin cancer (6 questions). The second part was developed for skin cancer risks of adolescents (8 questions) and indications of skin cancer (12 questions). The last part of form tended to determine their knowledge about SSE (4 questions) and behavior stages of SSE (1 question). Behavior change of SSE occurs in 5 stages (Table 1). Completion time of form is about 10 minutes.

Tools used in the Training Program for Raising Consciousness on Skin Cancer

Power point presentation: The approximately 30-minute training program contains such issues as the definition of skin cancer, people under risk, indications of danger, protection methods, skin self examination and its importance, who should perform SSE and when to perform?, What subjects should be considered during SSE?, and How to perform SSE? During the preparation of presentation content, training booklet prepared by the Skin Cancer Foundation in USA was used (www.skincancer.org).

Skin self-examination: It is a simple skin examination developed by the Skin Cancer Foundation in USA, consisting of 8 stages and easily applied by individuals. It explains how one can examine all body parts step by step (www.skincancer.org). Institutional permission was acquired for its Turkish adaptation. Pilot study was conducted with 30 adolescents and opinions of 9 experts were obtained, and consequently, the content validity of the form was determined as 0.98 (Koştu et al., 2012). At the end of the presentation, stages of SSE were taught twice by the researchers using demonstration technique.

Body map-examination schedule: It was distributed for adolescents to register their SSE behaviors in a three months duration after training session. It was designed by the researchers in sticker/post-it form. Body map is a drawing illustrating all body parts from head to foot. After individuals examine their bodies, they mark "mole, freckle or abnormal any change in body" in terms of asymmetry, border irregularity, color, and size properties.

Video: At the end of training, adolescents watched a 5-minute video "Dear 16 Years Old Me" with Turkish subtitle to enable remembering (www.dcmf.ca).

Poster/Booklet: Poster/booklets were prepared by the researchers and hung in classes and corridors of the school. Information shared during the presentation was summarized in poster/booklets.

Data Collection

Data collection was carried out in three phases. The 1st phase included preliminary evaluations to determine demographic characteristics, risk status of skin cancer, knowledge level of skin cancer (risk, indications) and behavior stages. In this stage, adolescents were given information in classes and forms were filled out. In the 2nd phase, SSE consciousness raising training based on TM was performed within the same day just after the evaluation of preliminary tests. In this stage, adolescents gathered in assembly room of the school as classes in pairs and they were given SSE training. At the end of this stage, adolescents were given an e-mail address. In the 3rd phase, adolescents were followed up three times to evaluate the efficacy of the training (on the 15th day after training and at the end of 1st and 2nd months). The followed up data were gathered by questioning the stages of SSE performing behaviors through e-mail.

Evaluation of Data

In order to evaluate the knowledge level of adolescents about skin cancer, they were asked to answer the true (1) or false (0) following statements about risk factors of skin cancer including "Are you light skinned?", "Do you have light eye color?", "Do you have a family history of skin cancer?", "Do you have brown/large moles in your

Table 1. Stages of Change in Skin Self Examination (SSE) based on Transtheoretical Model

	Stages Of Change In Skin Self Examination
Pre-contemplation	I do not regularly perform SSE every month, and I do not think to start it in the next 6 months.
Contemplation	I do not make SSE monthly, but I think to start it in the next 6 months.
Preparation	I do not make SSE every month, but I plan to start it as of next month at earliest.
Action	I have been making SSE every month for less than 6 months.
Maintenance	I have been making SSE every month for more than 6 months.

body?", "Do you have birthmark?", "Have you ever had blistering sunburn?", "Do you go artificial sun baths (solarium)?", and "Have you been subject to sun light for long period of time in your life?". The score of knowledge level about risk factors of skin cancer can be minimum 0 and maximum 8 points.

It was evaluated based on the true (1) and false (0) responses given by adolescents to statements in the section of knowledge level about the indications of skin cancer, which include "Is there an abnormal change in skin of any part of body (sudden enlargement of skin and appearing bright, brown, black or multicolored)", "Is there any wound healed for more than 3 weeks?" and "Color change, increasing size or thickness, surface change, disordered outer border, being larger than 6mm or surpassing the diameter of a pencil of a subsequently formed or congenital mole or any mark, and new marks forming after 21 years of age, itchiness, incrustation, fragmentation or bleeding of a mole or wound". The score of knowledge level about indications of skin cancer can be minimum 0 and maximum 12 points.

Adolescents were expected to answer the question "Who should perform the SSE?" as "Everyone", and the question "How often the SSE should be performed?" as "once in a month". Data were analyzed in SPSS 16.0 Packet Software with number, percentage, and paired sample t test analyses. The results were evaluated in 95% confidence interval at $p<0.05$ significance level.

Research Ethics

Necessary permissions were obtained from Izmir Provincial Directorate for National Education and ethical committee of Nursing Faculty of Ege University to conduct the study. Primary school managers, parents and adolescents were informed about the objective of the study and their consents were acquired. The permissions of David Cornfield Melanoma Fund and Skin Cancer Foundation in USA were obtained to use the data collection and training tools.

Limitations of the study

The study was performed only in one school in Izmir, data were collected through electronic mail in the follow up period, the study data were evaluated based on the self-report of adolescents and follow up covered a three-month period

Results

Demographic characteristics of adolescents and risk status of skin cancer

Half of the adolescents (50.5%) are male, and 58.4% are 13 years of age with a mean age of 12±1.15 years of age. Of adolescents, natural hair color of 29.4% is brown, 37.9% have brown/hazel eye, 29.4% are white skinned, and 47.2% have fewer than 10 moles in their bodies. 35.5% of adolescents stated that their skins are rarely sunburnt, 51.9% stated that their faces give normal response to sun, skins of 40.2% are sometimes tanned, and 42.1% stated that tanning moderately affects their skins (Table 2).

Knowledge levels of adolescents about risks and indications of skin cancer and skin self examination

Considering the knowledge level of adolescents about skin cancer, their pretest mean score on risks of skin cancer is 4.19±1.96, and posttest mean score is 6.79±1.67 (min:0, max:8). Their pretest mean score on indications of skin cancer is 7.45±3.76, and posttest mean score is 10.69±2.60 (min:0, max: 12). Considering the changes in knowledge levels of adolescents about factors increasing the risk of skin cancer and indications of skin cancer, the difference between pretest and posttest scores was found statistically significant ($p<0.05$).

Adolescents giving correct answer ("everybody") to the question "Who should perform the SSE?" was 48.6% before the training, while this increased to 92.1% after

Table 2. Risk Status of Adolescents in Terms of Skin Cancer

Properties		No	%
Natural Hair Color:	Light yellow, red	6	2.8
	Yellow, maroon	33	15.4
	Dark yellow, light brown	54	25.2
	Dark brown	63	29.4
	Black	58	27.2
Eye color:	Light blue, light green, light gray	14	6.5
	Blue, green, gray	17	7.9
	Brown, hazel	81	37.9
	Dark brown	62	29.0
	Dark brown, black	40	18.7
Natural skin color:	White	63	29.4
	Light/pale	49	22.9
	Beige/Yellow	50	23.4
	Greenish/light brown	27	12.6
	Dark brown/black	25	11.7
Number of freckle/mole in body:			
	More than 30	9	4.2
	Fewer than 30	23	10.7
	More than 10	44	20.6
	Fewer than 10	101	47.2
	None	37	17.3
Change in skin when staying under sun for long periods			
	Painful redness, swelling, peeling	32	15.0
	Swelling and peeling	29	13.5
	Rarely redness and swelling	40	18.7
	Rarely sunburn	76	35.5
	Not affected	37	17.3
Reaction of face to sun:			
	Very sensitive, easily reacts	28	13.1
	Sensitive	37	17.3
	Reacts normal	111	51.9
	Very resistive, hardly reacts	29	13.6
	Not react	9	4.2
Tanning of skin:	Never/always burns	26	12.1
	Rarely	61	28.5
	Sometimes	86	40.2
	Frequently	21	9.8
	Always	20	9.4
Effects of tanning on skin:			
	Very few/almost no effect	31	14.5
	A little	77	36.0
	Moderately	90	42.1
	Severely	13	6.1
	My natural skin color is black	3	1.3
Total		214	100

the training. Adolescents giving correct answer that SSE should be made "every month" was 43.0% before the training, while this increased to 75.7% after the training. Most of the adolescents (95.3%) stated that they do not make SSE before the training, while this decreased to 29.4% after the training. Adolescents stated "I do not know" as the reason for not making SSE before the training (80.8%), and this was reduced to 31.3% after the training (Table 3).

Stages of change in skin self examination behavior

Considering the change in stages of SSE behaviors, the rate of adolescents stating that "I do not make SSE regularly every month and I do not plan to make it in the next 6 months" was 52.8% before the training, and this decreased to 35.5% on the 15th day follow-up, 7.5% on the 1st month follow-up and 4.7% on the 2nd month follow-up. The behavior that "I do not make SSE every month, but I think to make in the next 6 months" was 18.7% before the training, and it increased to 24.3% on the 15th day, 28.0% in the 1st month, and 22.4% in the 2nd month follow up. The behavior that "I do not make SSE every month, but I think to make it as of next month at the earliest" was 20.1% before the training, and it decreased to 18.7% in the 15th day follow-up and then increased to 32.7% in the 1st month and 34.1% in the 2nd month follow-ups. The behavior that "I have applied SSE every month for fewer than 6 months" was 4.7% before the training, and it increased to 14.0% in the 15th day, 28.5% in the 1st month, and 36.0% in the 2nd month follow-ups. The behavior that "I have applied SSE every month for more than 6 months" was 3.7% before the training, and it increased to 7.5% after the training (on the 15th day), but it decreased to 3.3% in the 1st month and 2.8% in the 2nd month follow-ups (Table 4).

Table 3. Knowledge Levels of Adolescents about Skin Self Examination

Variables	Pre-training		Post-training	
	No	%	No	%
Who should make skin self examination?				
Women	16	7.5	3	1.4
Men	5	2.3	1	0.5
Youth	60	28	10	4.6
Children	2	0.9	1	0.5
Elders	27	12.6	2	0.9
Everybody	104	48.6	197	92.1
How frequently skin self examination should be made?				
Everyday	13	6.1	7	3.3
Once a week	40	18.7	25	11.7
Once a month	92	43	162	75.7
Once in 6 months	40	18.7	14	6.5
Once in a year	29	13.6	6	2.8
Status of making skin self examination				
Yes	10	4.7	63	29.4
No	204	95.3	151	70.6
The reason for not making skin self examination				
I do not know	173	80.8	67	31.3
I am busy, I forget it	14	6.5	63	29.4
I fear of finding something	14	6.5	14	6.6
I do not believe its efficacy	13	6.1	7	3.3
None-respondents	-	-	63	29.4
TOTAL	214	100	214	100

Discussion

More than one fourth of adolescents included in the study have dark brown hair, hazel eye and white skin. Approximately half of the adolescents stated to have fewer than 10 moles in their bodies. In literature, it is reported that having light hair color, blue-green eye color and light skin color and the presence of multiple moles in body increase the risk for skin cancer (Baum and Cohen, 1998; Cokkinides et al., 2002; Emmons et al., 2008; Saridi et al., 2009). Our findings are similar to the results of the study performed by Uysal et al. (2004) on 12-15 years of age students in Izmir reported that nearly 35% of students have light eye and skin color and also moles. Although it is a small group of adolescents some of them at risk.

More than one fourth of adolescents stated that their skin is rarely sunburnt when they stay under sun for long periods of time and half of them stated that their faces give normal response to sun. Nearly half of the adolescents indicated that their skins are sometimes tanned and tanning moderately affects their skin. The previous studies reported that the history of blistering sunburn, even once, in childhood and overexposure to sun increase the risk for skin cancer (Baum and Cohen, 1998; Lowe et al., 2002; Maguire-Eise et al., 2005). It is important that adolescents especially under risk due to types of their skin should be informed about the protective measures against the harmful effects of sun.

Table 4. Stages of Change in Adolescent Behavior of Making Skin Self Examination (SSE) by Transtheoretical Model

Stages of change in behavior of making SSE	Pre-training		Post-training (15th day)		2nd Follow-up (1st month)		3rd Follow-up (2nd month)	
	No	%	No	%	No	%	No	%
I do not regularly perform SSE every month, and I do not think to start it in the next 6 months.	113	52.8	76	35.5	16	7.5	10	4.7
I do not make SSE monthly, but I think to start it in the next 6 months.	40	18.7	52	24.3	60	28	48	22.4
I do not make SSE every month, but I plan to start it as of next month at earliest.	43	20.1	40	18.7	70	32.7	73	34.1
I have been making SSE every month for more than 6 months.	10	4.7	30	14.0	61	28.5	77	36.0
I have been making SSE every month for more than 6 months.	8	3.7	16	7.5	7	3.3	6	2.8
TOTAL	214	100	214	100	214	100	214	100

Knowledge levels of adolescents about the risks and indications of skin cancer were found low before the training, but they were found higher after the training. It could be claimed that this training organized on skin cancer raised awareness among adolescents and increased their consciousness. Thus, it is considered that this group of adolescents trained in the early period of life could start to take precautions to protect themselves from skin cancer.

Most of the adolescents did not perform SSE before the training, while the rate of those performing SSE increased to 29.4% after the training. In fact, most of the adolescents stated that they did not perform SSE because they did not know it before the training. The rate of those performing SSE was found to increase after the training. The findings indicate that the training became effective and was caused to behavior change.

When the behavioral change stages of performing SSE of adolescents are examined based on TM, adolescents stating that "I do not perform SSE regularly every month and I do not intend to start doing that in the next 6 months" was quite high before the training, while it was reduced after the training. In addition, adolescents stating that "I do not perform SSE every month, but I consider starting it in the next 6 months" increased after the training. This is a pleasing finding and proves that adolescents progressed in behavior change according to transtheoretical model. Similarly, in the study carried out by Kristja´nsson et al. (2003) based on transtheoretical model, it was reported that adolescents progressed from not-thinking to thinking of their behaviors of sun protection and consciousness stages of adolescents increased (Kristja´nsson et al., 2003).

In conclusion this study demonstrated that health behavior of performing SSE positively changes when a training program is organized to increase consciousness on how to perform SSE and the importance of skin cancer and especially the training programs in early periods of life are more effective. Nurses could realize the behavior change of adolescents about SSE for protection from skin cancer by providing information to adolescents, raising their consciousness and with repetitive reminding in their work places. It is recommended for nurses to take advantage of the health training tools used in this study and to carry out studies on broader sample groups and observe SSE behaviors for longer periods of time. Furthermore, school nurses could enable the early diagnosis of skin cancer cases by periodically screening students and transfering the risky cases to hospitals.

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