A NURSE-LED SCHOOL-BASED SUN PROTECTION PROGRAMME IN TURKEY

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SUMMARY

Objective: The aim of this study was to determine the effects of a nurse-led school-based sun protection programme in Turkey.

Methods: A randomized controlled trial was performed at two public schools between February and October 2014. Children with written consent from their parents were screened by nurses for skin type, and 80 children at moderate to high risk for skin cancer were included in the study. The sample was randomized by age, gender and skin type. Stratified and block randomizations were used. The participants were separated into an intervention group (n = 40) and control group (n = 40). Data were collected using a personal information form and two scales for sun protection behaviour and self-efficacy.

Results: In the intervention group, the pretest mean score for sun protection behaviour was 19.25 ± 5.44 and increased significantly in the posttest assessment (33.05 ± 4.23, $p < 0.001$). Self-efficacy scores also increased significantly after the intervention (pretest 20.50 ± 6.68, post-test 35.85 ± 4.70, $p < 0.001$). However, there were no significant increases in mean sun protection behaviour or self-efficacy scores in the control group ($p > 0.05$).

Conclusion: A nurse-led school-based sun protection programme effectively promoted children's self-efficacy and sun protection behaviour.

Key words: nurse, children, sun protection, skin cancer, school-based, Turkey

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INTRODUCTION

The rising incidence of skin cancer due to the harmful effects of ultraviolet (UV) radiation has become a major public health problem, and has been especially remarkable over the last 50 years in predominantly fair-skinned populations such as those in Australia, New Zealand, North America, and some western European countries (1). In Turkey, data from the Turkish Public Health Institute indicate that the incidence of melanoma is 2.1/100,000 in men and 1.6/100,000 in women, and skin cancer is one of the 10 most common cancers (2).

There is a strong relation between lifelong exposure to sun, about 25% of exposure, the formation of melanoma and other skin cancers occur before the age of 18 (3, 4). The significant relationship between the extent of childhood UV exposure and subsequent skin cancer development in adulthood underlines the importance of promoting sun protection behaviour during childhood (3–5). A single blistering sunburn in childhood doubles an individual's risk of developing melanoma compared to someone with no history of sunburn (6–8). In view of this relationship, it is estimated that 80% of all skin cancers can be prevented by practicing proper sun protection behaviour during childhood and adolescence (4, 5).

Awareness of the detrimental effects of UV radiation on the skin and the 6-fold increase in melanoma and non-melanoma cancer incidence in the last 60–70 years have led to the development of prevention policies (3, 8–10). Children spend a large amount of their time outside the home engaging in outdoor activities such as games and sport activities (11–12). In particular, children are exposed to sunlight while they are in the school environment (13, 14). Considering the long hours spent at school and the role of sun exposure in childhood in skin cancer development, children should be protected from the sun at school (11, 12). Epidemiological studies show that sun protection behaviour acquired in early childhood is effective in cancer prevention (4, 6). Nurses are in an excellent position to promote sun protection behaviours because they work closely with schools, communities, and families. Through the implementation of nurse-led sun protection programmes, nurses can help raise awareness of sun protection behaviours among children and their families (15, 16). Nurses have an important role in protecting and promoting health within the scope of health services at school as part of primary prevention. Early diagnosis and prevention of skin cancer are also important for secondary prevention in the school environment. Teaching children the purpose and importance of sun protection can raise sun protection awareness even at young ages (3, 6). Recommended protective behaviours include using a sunscreen with an SPF of at least 30, wearing protective clothing, using sunglasses, avoiding the sun during the mid-day hours, avoiding artificial tanning facilities (solariums), and regularly performing skin self-examinations for changes in skin blemishes, spots and freckles every season (8).

In Miami, USA, where there are initiatives to develop prevention programmes and policies, a study in primary and secondary

schools showed that school-based education programmes can achieve the national health objective of detecting and preventing threats such as skin cancer (7, 10). Training programmes emphasize prevention behaviours such as avoiding the sun during the mid-day hours, using sunglasses, wearing a hat, using a sunscreen, and avoiding solariums (7, 10). Due to its geographical location, some parts of Turkey are heavily exposed to sunlight for a substantial part of the year (17). In the western part of Turkey, including the province of Izmir, daytime lasts 7–11 hours for more than half of the year. Even in winter, this time does not fall below four hours. In summer, the UV index in Izmir is very high, even when assessed early in the day at approximately 9–10 a.m. (17). Therefore, sun protection behaviour in school children is an important public health education topic in Turkey. Gathering data about the behaviour of this group in Turkey is a vital first step in designing nursing interventions for sun protection behaviour. The aim of this study was to determine the effects of a nurse-led school-based sun protection programme in Turkey.

MATERIALS AND METHODS

Design

This randomized controlled trial was carried out in two public schools in İzmir, in western Turkey, between February and October 2014.

Study Population

The study population included 144 children. Children with written consent from their parents were screened by nurses for skin type. After screening, 96 children were found to have moderate-to-high risk skin type (I, II, III) (18). Sixteen eligible children were excluded due to lack of parental consent. The study sample comprised 80 children based on a confidence interval of 95% and statistical power of 80% (19). The statistical analysis done at the end of the study showed that the study had statistical power of 73% based on a confidence interval of 95%.

Children, who were 8–9 years old, were screened and considered at risk of skin cancer by a nurse based on a Fitzpatrick skin type between I and III, and whose parents gave written consent were included in the study (18). Children whose parents did not give written informed consent and who had skin type IV, V and VI were excluded (18) (Fig. 1). Stratified and block randomizations were used for randomization. The schools were assigned into the intervention and the control groups by tossing a coin. Then, students in both groups were randomized in terms of their age, gender and skin type (19).

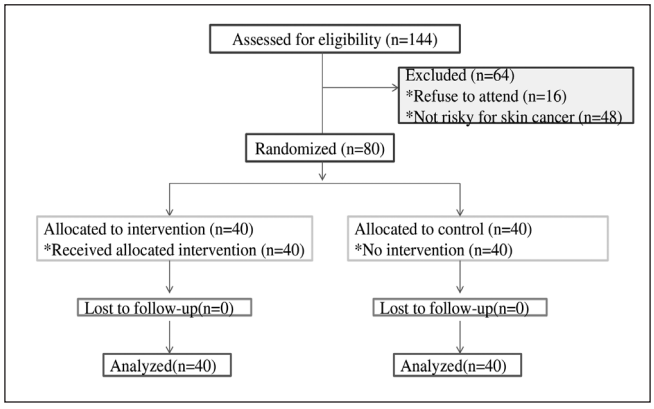

Fig. 1. *CONSORT diagram of the study.*

Instruments

The study was based on the transtheoretical model developed by Prochaska and Velicer. This model helps individuals make changes in their behaviour and provides guidance for health promotion programmes (20). Data were collected using a personal information form (including age, gender), Fitzpatrick skin type form (FSTP), sun protection behaviour scale (SPBS), and sun protection self-efficacy (SPSE). The FSTP was developed by Fitzpatrick and classifies individuals' skin type according to their response to sun exposure (i.e., the extent of burning and tanning) (18). The form includes 10 questions and was applied by a nurse for skin type screening in the present study. The SPBS measures the incidence of sun protection behaviour when outdoors for periods longer than 15 minutes. It is scored on a five-point scale ranging from 1 to 5 (1 – never, 2 – rarely, 3 – sometimes, 4 – often, and 5 – always) with $\alpha = 0.86$ (21–23). The SPSE examines self-efficacy regarding protection from the sun. It is also scored on a five-point scale (1 – not at all confident, 2 – not very confident, 3 – moderately confident, 4 – very confident, and 5 – extremely confident) with $\alpha = 0.84$ (20, 22).

Interventions

The intervention group was offered a six-hour training programme based on the transtheoretical model in order to promote sun protection behaviour and to reinforce self-efficacy. The programme was prepared by the researchers in consideration of the SunSmart Program implemented in Australia, the SunWise School Program developed by the United States Environmental Protection Agency, and the sun protection guide issued by the Center for Disease Control and Prevention (13). The programme included various educational tools such as a sun protection story, activity book, PowerPoint presentations, cartoons, and puzzles (24, 25).

Refresher trainings were conducted 15 days, 1 month, and 2 months after the initial training (9, 26). Sun protection behaviour and self-efficacy of the children were evaluated at the beginning of the study and six months after the programme. As gifts to support their sun protection behaviour, the children were given an FDA-approved sunscreen with 50+ SPF, a white cotton short-sleeved T-shirt as protective clothing, sunglasses with 100% UV protection, and a wide-brimmed hat. A nurse-led school-based sun protection programme is shown in Figure 2.

Data Analysis

Data were analyzed using Statistical Package for Social Sciences 17.0 software. The Shapiro-Wilk test showed that the data were not normally distributed. Descriptive characteristics were evaluated with frequencies, percentages, means, and standard deviations. The chi-square test was used to test homogeneity. Intragroup comparisons were made with Wilcoxon signed-rank

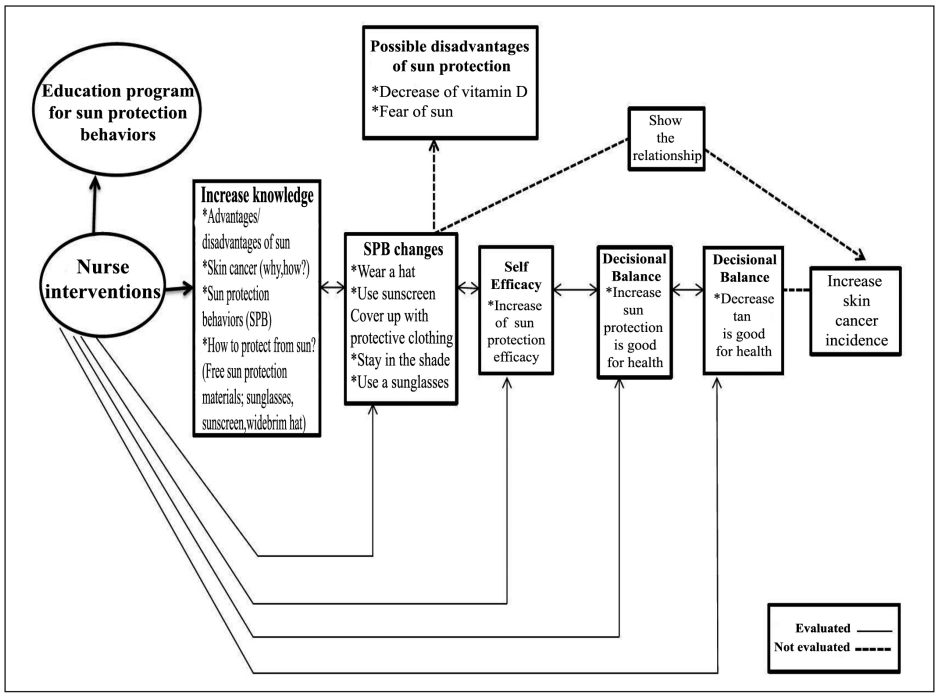

Fig. 2. *A nurse-led school-based sun protection programme in Turkey.*

test and intergroup comparisons were made with Mann-Whitney U test. A p value less than 0.05 was considered significant (19).

Ethical Approval

The study protocol was approved by the institutional review board of the Ege University Medical School. Written informed consent was obtained from parents of the children included in the study. After the study was completed, the nursing interventions offered to the intervention group were also given to the control group.

RESULTS

Characteristics of the intervention and control groups are shown in Table 1.

Mean scores for the SPBS and its subscales are shown in Table 2. Pretest and posttest mean SPBS scores were 19.25±5.44 and 33.05±4.23 in the intervention group, and 20.52±6.44 and 21.70±5.78 in the control group, respectively (Table 2). The difference between the pretest and posttest values was significant in the intervention group ($Z=-5.515$, $p<0.001$), but not in the control group ($Z=-1.681$ $p=0.093$). The difference between the intervention and control groups' SPBS scores was not significant pretest ($U(z)=-1.262$, $p=0.207$) but was significant posttest ($U(z)=-6.919$, $p<0.001$).

The mean SPSE scores in the intervention group were 20.50±6.68 pretest and 35.85±4.70 posttest (Table 3), which was a significant difference ($Z=-5.517$, $p<0.001$). Mean pretest and posttest SPSE scores in the control group were 23.77±7.54 and 24.17±6.75 (Table 3), which was a nonsignificant difference ($Z=-0.350$, $p=0.726$). However, the difference in mean SPSE score between the two groups was significant at both pretest

Table 1. *Characteristic of intervention and control groups (N=80)*

Characteristics		Intervention		Control		Total		χ^2, p
		n	%	n	%	n	%	
Age group	8 years	30	75.0	28	70.0	58	72.5	$\chi^2=0.251$, $p=0.803$
	9 years	10	25.0	12	30.0	22	27.5	
Gender	Female	20	50.0	20	50.0	40	50.0	$\chi^2=0.000$, $p=1.000$
	Male	20	50.0	20	50.0	40	50.0	
Skin type	Type I	9	22.5	9	22.5	18	22.5	$\chi^2=0.065$, $p=0.968$
	Type II	16	40.0	17	42.5	33	41.2	
	Type III	15	37.5	14	35.0	29	36.3	
Total		40	100	40	100	80	100	

χ^2 – Chi square test

Table 2. *Mean item and scale scores of sun protection behaviour scale (N = 80)*

Items	Intervention (n = 40)		Control (n = 40)	
	Pretest	Posttest	Pretest	Posttest
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Stay in the shade	2.82 ± 0.78	4.57 ± 00.50	2.85 ± 1.07	3.00 ± 1.10
Avoid the sun during the mid-day hours	2.75 ± 0.77	4.60 ± 0.50	2.70 ± 1.01	2.85 ± 1.00
Limit your exposure to the sun during the mid-day hours	2.75 ± 0.77	4.35 ± 1.07	2.72 ± 1.01	2.92 ± 0.94
Use a sunscreen	2.20 ± 0.88	3.87 ± 0.96	2.52 ± 1.03	2.62 ± 0.95
Use a sunscreen with an SPF of 15 or more on your face	2.20 ± 0.88	3.87 ± 0.96	2.55 ± 1.10	2.67 ± 1.02
Use a sunscreen with an SPF of 15 or more on all your sun exposed areas	2.20 ± 0.88	4.10 ± 0.50	2.47 ± 1.03	2.67 ± 0.88
Wear a hat	2.22 ± 0.94	3.85 ± 1.07	2.57 ± 0.84	2.65 ± 0.83
Wear a hat with a wide brim	2.10 ± 0.90	3.82 ± 1.05	2.12 ± 1.10	2.30 ± 0.99
Sun avoidance subscale	8.32 ± 2.30	13.52 ± 1.90	8.27 ± 2.93	8.77 ± 2.82
Sunscreen subscale	6.60 ± 2.64	11.85 ± 2.24	7.55 ± 3.07	7.97 ± 2.62
Hat use subscale	4.32 ± 1.81	7.67 ± 2.12	4.70 ± 1.66	4.95 ± 1.61
Mean scale score	19.25 ± 5.44	33.05 ± 4.23	20.52 ± 6.44	21.70 ± 5.78

SD – Standard deviation

Table 3. *Mean item and scale scores of sun protection self-efficacy (N = 80)*

Please rate how confident you are that you would use sun protection in each situation	Intervention (n = 40)		Control (n = 40)	
	Pretest	Posttest	Pretest	Posttest
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Use a sunscreen whenever you are out in the summer sun for more than 15 minutes	2.25 ± 0.92	3.95 ± 0.74	2.55 ± 1.15	2.57 ± .90
Stay in the shade when all your friends are enjoying themselves in the sun	2.50 ± 1.01	4.15 ± 0.36	2.90 ± 1.21	2.87 ± 1.15
Cover up with protective clothing even when it is hot outside	2.47 ± 0.87	4.12 ± 0.33	2.75 ± 1.19	2.67 ± 1.41
Use a sunscreen when no one else you are with is using sunscreen	2.30 ± 0.82	3.97 ± 0.76	2.60 ± 1.19	2.67 ± 1.07
Avoid going outside in the summer sun during the midday hours	2.70 ± 0.72	4.20 ± 0.40	2.90 ± 1.15	2.82 ± 1.23
Wear a hat with a wide brim even if you do not like how it looks	2.05 ± 0.95	3.77 ± 1.09	2.32 ± .99	2.42 ± 1.03
Use a sunscreen even if you do not like how it feels	2.07 ± 0.94	3.95 ± 0.74	2.62 ± 1.14	2.72 ± 1.01
Use a sunscreen even if you want to get a tan	2.07 ± 0.94	3.95 ± 0.74	2.55 ± 1.28	2.75 ± 1.25
Wear a hat even though no one else does	2.07 ± 0.99	3.77 ± 1.09	2.57 ± 0.98	2.65 ± 0.97
Sun avoidance subscale	7.67 ± 2.39	9.57 ± 1.41	8.55 ± 2.85	8.65 ± 2.86
Sunscreen use subscale	8.70 ± 3.50	12.25 ± 2.44	10.32 ± 4.17	10.47 ± 3.95
Hat use subscale	4.12 ± 1.95	5.67 ± 1.73	4.90 ± 1.87	4.92 ± 1.67
Mean scale score	20.50 ± 6.68	35.85 ± 4.70	23.77 ± 7.54	24.17 ± 6.75

SD – Standard deviation

assessment ($U(z) = -2.481$, $p = 0.013$) and posttest assessment ($U(z) = -6.892$, $p < 0.001$).

DISCUSSION

The SPBS is an effective means of evaluating individuals' sun protection behaviour. This scale is used to assess sun avoidance, sunscreen use, and hat use (23, 27). Before the training programme, both the children in the intervention group and those in the control group were found to rarely practice sun protection behaviour. However, in the posttest assessment, SPBS score significantly increased in the intervention group but remained unchanged in the control group. This demonstrated that the children in the intervention group exhibited sun protection behaviour often, while those in the control group continued to rarely exhibit

this behaviour. In countries such as Australia, Sweden and the United States of America, the UV index is high in all seasons, and skin cancer prevention and sun safety programmes are applied in these countries (9, 16, 26). School-based sun safety programmes have demonstrated the importance of school in acquiring behaviour protective against sunlight, and have also revealed the need for continuous and multiple interventions. In experimental studies, children in intervention groups displayed significant differences in terms of sun protection behaviour like avoidance, sunscreen use, and wearing hats and protective clothes compared to those in control groups (13, 14). Milne et al. determined that sun protection programmes implemented in Australia resulted in greater avoidance in the midday hours, less sun exposure, and increased sun protection behaviour like wearing protective clothing and staying in the shade (28). Gilaberte et al. from Spain also reported that staying in the shade and wearing protective clothing significantly increased in primary school students after an intervention (29). Similarly, Norman et al. found that school children got significantly higher SPBS scores after an intervention (30). Mays et al. also observed significant increases in children's sun protective behaviour such as using sunscreen, wearing protective clothing, staying in the shade, and avoiding harmful behaviour (31). Therefore, the results of the present study are consistent with the previous studies of school-age children found in the literature.

The SPSE scale is used to evaluate an individual's confidence in adopting certain behavioural changes such as avoiding sunlight, using sunscreen, and wearing a hat (21, 23). Before nursing interventions, both the intervention group and the control group similarly marked "not very confident" about their sun protection behaviour. In the posttest, the children in the intervention group expressed feeling very confident, but the control group experienced no change in their confidence in their sun protection behaviour. Aygün and Ergün reported significant increases in adolescents' self-efficacy about their sun protection behaviour ($p < 0.05$) (21). De Vries et al. showed a significant relation between self-efficacy and wearing protective clothes (32). Buller et al. noted that sun protection self-efficacy significantly increased in students who received training compared to controls (33). Consistent with the literature, the present study also revealed a positive influence of nursing interventions on children's self-efficacy.

Limitations of this study include the self-reported data of the students, therefore, the results of the study cannot be generalized. The sun protection behaviour of children was also limited to the factors measured by the scales used in the study.

CONCLUSION

Authors determined that a nurse-led school-based sun protection programme was effective in increasing children's self-efficacy and sun protection behaviour. The results show that nursing interventions and the model used were useful and practical. The training programme used in this study can serve as a guide for health professionals to prevent health problems and promote healthy behaviours in school children. The results of this study will also facilitate the development of future national school health programmes in Turkey.

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Conflict of Interests

None declared

Authors' Contributions

ÖE, AB: study design, data analysis, manuscript preparation; ÖE: data collection, drafting of manuscript; AB: critically reviewed the manuscript for final publication.

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