

RESEARCH ARTICLE

What Turkish Nurses Know and Do about Skin Cancer and Sun Protective Behavior

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Abstract

Background: Skin cancer is a global health problem that can be prevented by protective behavior promoted by nurses. In Turkey, only few studies have examined current knowledge of nurses related to skin cancer and to reveal their attitudes towards sun exposure and current protective behavior. **Materials and Methods:** This descriptive cross-sectional study was performed from March 11 to May 30, 2013 with a study sample of 310 nurses working in two state hospitals located in Karabük and Safranbolu. **Results:** Mean age of the nurses was 30.3 ± 6.89 years and 96.1% of them had graduated with a Bachelor degree. The participants were predominantly female (n=284). Knowledge level about skin cancer was significantly higher for females compared to males. **Conclusions:** Nurses do not have sufficient knowledge about skin cancer and are not adequately protecting themselves from ultraviolet light, the primary risk factor for skin cancer. While they demonstrated a responsible attitude towards avoiding sunburn and the need for adequate sun protection, they do not fully appreciate the extent to which the sun can cause skin cancer and that they lack full understanding about the need to protect the skin from burning and to avoid long term sun exposure in Turkey.

Keywords: Skin cancer - nurse - nurse attitude - sun exposure - sun protection behavior - Turkey

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Introduction

Skin cancer is a worldwide health problem (Gies et al., 1998; Young et al., 2005; Yurtseven et al., 2012). According World Health Organization (WHO), annually about 2 to 3 million people suffer from non-melanoma skin cancers (NMSC), whereas the number for malignant melanomas (MM) is 132,000 per year (WHO, 2003). Moreover, average annual increase of non-melanoma skin cancers has been found about 3-8% (Diepgen and Mahler, 2002; Saridi et al., 2009). Skin cancer incidence is 18.91 per 100,000 people in Turkey which makes the disease the third most commonly diagnosed type of cancer in the country (Turkeys Statistical Yearbook, 2011).

Although, skin cancer is a potential threat for every individual regardless of baseline skin pigment, people with fair or freckled skin, fair or red hair, blue, green and hazel eyes belong to the highest risk group (WHO, 2003; Lens and Dawes, 2004; Gallagher, 2005). Risk factors for MM include dysplastic nevi and high number of ordinary nevi (more than 50) whereas tendency to burn and development of freckles with sun exposure are potential risk factors for the NMSC (CDC, 2002; WHO, 2003; NHS, 2011; Longo et al., 2011). Additionally, genetic predisposition plays an important role in development of MM. Some studies suggest that nearly 10% of melanoma patients have had a family history of melanoma (Gallagher, 2005; Longo

et al., 2011). Approximately one half of all melanomas occur in persons under 50 age. Indeed, melanoma is one of the most common cancers found in persons under 30 age (Armstrong and English, 1996). It is the most common cancer occurring among persons in the 25-29 ages and the third most common type in the 20-24 ages (CDC, 2002).

Ultraviolet radiation (UV) is the main factor behind skin cancer. UV light can initiate carcinogenesis and excessive exposure to the UV is the prime reason of melanoma and non-melanoma cancers, possibly accounting for up to 90% of all skin cancer cases (Armstrong and Krickler, 1996; Thomas, 2009; Narayanan and Saladi, 2011). Several studies reveal the correlation between the NMSC and increased sun exposure, exposure to UV light, outdoor activities, changes in clothing style, increased longevity and ozone depletion (Garvin and Eyles, 2001; Diepgen and Mahler, 2002). In another study, has found that exposure to high doses of intermittent sunlight, especially early in life, is an important risk factor for developing MM (Marks, 1999). In this sense, Karabük province of Turkey with its average temperature over 38 °C in the summer and with high rates of UV rays constitutes a risk zone for the skin cancer (Turkeys Statistical Yearbook, 2011).

With the exception of the melanoma, the skin cancers can be treated with surgical intervention. Treatment for skin cancer includes cryosurgery, curettage and electrodesiccation, tumor excision (Antony, 2000). The

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disease is an almost preventable one (WHO, 2003; Saraiya et al., 2004). Primary prevention measures such as minimizing sun exposure by changing sunbathing habits, avoiding artificial tanning devices, using sunscreen, seeking shade, using a sunscreen with appropriate sun protection factor, wearing sunglasses, and wearing protective clothing can significantly reduce the number of cases (WHO, 2003; Warren et al., 2004). Secondary prevention is based on early detection of skin cancer. Early detection involves regular skin examinations for high-risk individuals and screening programs to identify those at high risk (WHO, 2003; Geller et al., 2005; Jones et al., 2007; Lazovich et al., 2012).

Nurses are primarily responsible for preventing diseases and public health promotion. For these, they should maintain their own health. Although there are various studies on this subject in other countries (Morrison, 1996; McCormick et al., 1999; Darling and Ibbotson, 2002), no research on nurses' knowledge and their protective behaviors about skin cancer has been conducted in Turkey. This study aims to fill this gap by assessing the current knowledge level of Turkish nurses related to skin cancer and by revealing their attitudes towards sun exposure and their protective behaviors.

Materials and Methods

Study design

The study was conducted as a descriptive cross-sectional design.

Setting and sample

The study was carried out at Karabük State Hospital and Safranbolu State Hospital which are located at the Western Black Sea Region of Turkey from March 11 to May 30, 2013. Two hundred and forty-six nurses work at the Karabük State Hospital and 70 nurses at the Safranbolu State Hospital. Six nurses did not want to participate in the study. Hence, the study was conducted with the participation of 310 nurses (98.1% response rate).

Data collection

The questionnaire was developed by researchers after a review of the literature (McCormick et al., 1999; Darling and Ibbotson, 2002; Miles et al., 2005; Johns et al., 2007; Saridi et al., 2009; Lindow and Shelestak, 2011; Yurtseven et al., 2012; Ramezanpour et al., 2013). The questionnaire was composed of three parts;

The first part included 18 questions to reveal general characteristics of the nurses. The second part included 14 questions to find out the degree of their knowledge on risk factors about skin cancer. The high score indicates a low level of knowledge. The final part consisted of 33 questions to determine the practices of the nurses related to protection from harmful effects of the sun. 12 of the questions at the final part were related with the daily behaviors of the participants, 14 were about sunscreen usage and 5 were on behaviors related to their subjection to sunlight.

A pilot questionnaire was conducted over 15 nurses in order to identify and eliminate bias in the questionnaire

design and minor revisions were made afterwards. Data obtained during the pilot study was included in study results.

Statistical analysis

Statistical analysis of the data was performed. Frequency and percentage were calculated for all responses in the survey. Data analysis was performed using the student T tests ANOVA, and correlation analyses were used. Results had 95% confidence interval with $p < 0.05$, indicating statistical significance.

Ethical considerations

Ethical permission for the study was obtained with approval of appropriate management authority prior to data collection. The researcher followed the principles of the Declaration of Helsinki and received oral consent of participants. Participation in the survey was voluntary and nurses were free to withdraw from the study at any time. Nurses were exposed to minimal, if any, risk during participation. Each interview took approximately 15-20 minutes and nurses received no benefits for their participation. Interviews were anonymous and data remained confidential throughout the study.

Results

Socio-demographic characteristics of nurses 310 of the 316 nurses (98.1%) working in Karabük and Safranbolu state hospitals agreed to participate in the survey whereas 6 nurses (0.9%) refused to participate. Table 1 shows the socio-demographic characteristics of the nurses. 91.6% (n=284) of the participants were female whereas 8.4% (n=26) were male. The mean age of the nurses was 30.26 ± 6.89 . 69% (n=214) of the nurses are married and 96.1% (n=298) had graduated bachelor's degree. 83.9% (n=260) of them did not have any chronic illness. 4.8% (n=15) of the nurses had a family member with skin cancer and 41.3% (n=128) of them had been sunburnt. A clear majority of the participants (n=128) have been sunburnt at least once. Regarding their skin types, 70% (n=217) of the participants had fair skin. The majority had brown/black hair (89.1%, n=276) and dark eyes (77.1%, n=239). 77.4% (n=240) of the nurses had birthmark. 91.6% (n=284) had nevi and 93.7% (n=266) of the participants with nevi had nevus less than 50.

Nurses' knowledge of skin cancer

It has been found that a clear majority of the participants had given true answers to questions on skin cancer. The wrong answers that the participants gave included 'some viruses can cause skin cancer', 'skin cancer can easily be diagnosed', 'people with more than 50 nevi may be under higher risk of skin cancer', and 'people with birthmark may be at risk for skin cancer'. Two hundred fifty of the participants replied 'I do not see myself at skin cancer risk and there is nothing I can do to prevent skin cancer' (Table 2).

Table 3 shows mean scores of nurses' knowledge about risk factors concerning knowledge of skin cancer based on some demographical characteristics. The

Table 1. Characteristics of Nurses

Characteristics	N	%	
Age (Mean±SD) (min- max)	30.26±6.89	(18-55)	
Gender	Female	284	91.6
	Male	26	8.4
Marital status	Married	214	69.0
	Single	90	29.1
	Divorced	6	1.9
Education	Bachelor' degree	298	96.1
	Associate's degree	12	3.9
Existence of any chronic disease	Yes	50	16.1
	No	260	83.9
If yes (n=50)	Hearth disease	6	12
	Diabetes mellitus	10	20
	Kidney disease	4	8
	Others*	30	60
Having a family member with skin cancer	Yes	15	4.8
	No	295	95.2
Having been sunburnt	Yes	128	41.3
	No	182	58.7
If yes, how many times (n=128)	at least once	54	42.2
	Twice	34	41.51
	And up to three	40	31.2
Skin tone	Fair	217	70
	Dark	93	30
Eye color	Dark (Brown, Black)	239	77.1
	Fair (Blue, green, hazel)	71	22.9
Hair color	Black/Brown	276	89.1
	Other (Red, blond)	34	10.9
Existence of the birthmark	Yes	70	22.6
	No	240	77.4
Existence of nevi	Yes	284	91.6
	No	26	8.4
If yes (n=284)	Less than 50	266	93.7
	More than 50	18	6.3

*Rheumatoid arthritis, Lumber disk...etc.

Table 2. Knowledge about Skin Cancer

Knowledge of skin cancer	Correct n (%)
Ultraviolet rays can cause skin cancer	291 (93.9)
Exposure to radiation can cause skin cancer	281 (90.6)
Exposure to chemical agents can cause skin cancer	281 (90.6)
Some viruses can cause skin cancer	139 (44.8)
The mortality of skin cancer may be lower than in other cancers	216 (69.7)
Skin cancer diagnosis can be easily	148 (47.7)
People with fair skin color may be at risk for skin cancer	216 (69.7)
People with fair eye color may be at risk for skin cancer	226 (71.6)
People with more than 50 nevi may be under higher risk of skin cancer	117 (37.7)
People with birthmark may be at risk for skin cancer	117 (37.7)
People with more sunburnt in their skin may be under higher risk of skin cancer	171 (55.2)
People with family history of skin cancer may be under higher risk of skin cancer	246 (79.4)
People with whitish, brown or red body marks may be under higher risk of skin cancer	203 (65.5)
Non-healing wounds on skin may be skin cancer symptom	224 (72.3)
Nevi that increase in size, scratching nevus or bleeding nevus might be skin cancer symptom	228 (73.5)
Whitish body marks might be skin cancer symptom	152 (49.0)
Nodule and/or mass might be skin cancer symptom	203 (65.5)
Parenchyma in any part of the body might constitute a risk factor for skin cancer	173 (55.8)
I do not see myself at skin cancer risk. There is nothing I can do to prevent skin cancer	250 (80.6)

knowledge level significantly differed with respect to gender. Knowledge level was significantly higher for females (28.05±7.17) compared to males (40.96±10.55). As a result of the multivariate analysis of variance, it is understood the gender affects the level of knowledge about skin cancer (p=0.000), but does not influence the

Table 3. Level of Knowledge of Nurses Based on a Variety of Factors

Variables	N	%	Mean level of knowledge±SD	p	
Gender	Female	284	91.6	28.05± 7.17	t=-8.397
	Male	26	8.4	40.96±10.55	p=0.001
Age	30 and below	148	47.7	29.91±8.10	t=1.584
	30 and up to	162	52.3	28.41±8.45	p=0.114
Having a family member with skin cancer	Yes	15	4.8	27.20±10.48	t=-0.923
	No	295	95.2	29.23± 8.18	p=0.357
Skin tone	Fair	217	70	28.95±8.46	t=-0.512
	Dark	92	30	29.48±7.98	p=0.609
Hair color	Black/ Brown	276	89.1	28.74±8.40	t=-1.655
	Other (Red, Blond)	34	10.9	29.55±9.28	p=0.443
Having been sunburnt	Yes	128	41.3	30.15±9.69	t=1.827
	No	182	58.7	28.41±7.11	p=0.069
Eye color	Dark	239	77.1	28.82± 7.62	t=-1.215
	Fair	71	22.9	30.18±10.52	p=0.225
The existence of the birthmark	Yes	70	22.6	27.91±6.79	t=-1.388
	No	239	77.4	29.48±8.69	p=0.166
The existence of the nevi	Yes	284	91.6	29.04±8.37	t=-0.581
	No	26	8.4	30.03±7.60	p=0.562
If yes	Less than 50	266	93.7	29.02± 8.20	t=0.519
	More than 50	18	6.3	27.94±10.52	p=0.604

*T tests

Table 4. Protective Behaviors from Skin Cancer

Protective behavior statement (Question Item)	Positive behaviors (%)
Regarding of clothes	
I use sun glasses that filter negative sun ray when I go outside	235 (75.8)
I use sunhat when I go out	41 (13.2)
I prevent myself from excessive sun light	257 (82.9)
I pay attention to avoid going outside on midday	247 (79.7)
I do not go swimming between 11 am and 4 pm	96 (31.2)
I do not have sunbath at the beach between 11 am and 4 pm	115 (62.9)
I use sun cream every half an hour when I am at the beach	107 (34.5)
I drink at least 8-10 glasses of water per day	194 (62.6)
I do not go out between 10 am and 4 pm	141 (45.4)
When I go outside, I stay in shade	207 (66.8)
When I go outside, I use sunshade	54 (17.4)
I wear light-colored cloth	184 (59.3)
Sun screening use	
When I am exposed to sun light, I use at least factor 15 sunscreen	143 (46.2)
I have been using sunscreen since my childhood	78 (25.2)
When shopping, I firstly pay attention to the brand name of the sunscreen	166 (53.5)
When shopping, I firstly pay attention to the price of the sunscreen	103 (33.2)
When shopping, I firstly pay attention to the SPF number of the sunscreen	188 (60.7)
When shopping, I firstly pay attention to the perfume of the sunscreen	61 (19.6)
When shopping, I firstly pay attention to the exclusion of perfume from the sunscreen	122 (39.3)
I use sunscreen one hour before I go outside	93 (29.9)
I use sunscreen 15 minutes before I go outside	113 (36.4)
I use sunscreen when I am having sunbath	119 (38.4)
I use sunscreen after sunbath	59 (19)
I use sunscreen only in the mornings	42 (13.6)
I regularly use sunscreen in each two hours	61 (19.9)
I use sunscreen only when I am sunburnt	65 (21)
Exposure of sun light	
I attempt to avoid exposure to sunlight no more than one hour in daily life	160 (51.6)
I attempt to avoid exposure to sunlight no more than 1 to 3 hours in daily life	154 (49.7)
I attempt to avoid exposure to sunlight no more than 4 to 6 hours in daily life	152 (49.1)
I attempt to avoid exposure to sunlight no more than 6 to 8 hours in daily life	146 (47.1)
I attempt to avoid exposure to sunlight no more than 8 hours in daily life	148 (47.7)

behaviour of protection ($p=0.087$) from it. There was not any statistical meaningful difference between the variables of age, education, skin cancer family history, having been sunburnt, skin tone, eye color, hair color and existence of nevi conditions and the point averages for the knowledge of the risk factors for skin cancer.

Nurses' protective behaviors about skin cancer

The analysis of data indicates that most nurses had a good protective behavior about skin cancer in terms of items listed in Table 4. In general, percentages of "positive behaviors" responses for all the knowledge items are higher than "negative behaviors" and "those who don't know" answers. However the nurses did not have sufficient positive behaviors regarding skin cancer which is reflected in the rates of answers to the statements "I use sun hat when I go out" ($n=41$), "I do not go swimming between 11 am and 4 pm" ($n=96$), "I use sun cream every half an hour when I am at the beach" ($n=107$), "I do not go out between 10 am and 4 pm" ($n=141$), "When I go outside, I use sunshade" ($n=54$), "When I am exposed to sun light, I use at least factor 15 sunscreen" ($n=143$), "I have been using sunscreen since my childhood" ($n=78$), "when shopping, I firstly pay attention to the perfume of the sunscreen" ($n=61$), "I use sunscreen only when I am sunburnt" ($n=65$).

Discussion

This study aimed to assess about nurses' knowledge and protective behavior towards skin cancer. Most of them had fair skin color. The majority had brown/black hair and dark eyes. Less than half of nurses had been sunburnt. Approximately three quarters had birthmark, most of them had nevi and the majority of those with nevi had less than 50 nevi. As noted in other studies (Davis et al., 2002; Argyriadou et al., 2005; Halpern and Kopp, 2005; Yurtseven et al., 2012), these findings may be indicated a moderate risk for development of skin cancer (WHO, 2003). The literature suggests that the nurses with fair hair and colored-eyes which constitute a minority in the sample are under higher risk of skin cancer compared to other nurses (CDC, 2002; WHO, 2003; NHS, 2011). In addition, although they have lower risk of skin cancer people with dark skins are also exposed to ultraviolet light and negative consequences for eyes and immunity system. WHO stated that 20% of these people go blind due to being exposed to ultraviolet light. Thus, not only people with fair skin but all people should be protected from negative effects of sun (CDC, 2002; WHO, 2003). Nurses with more nevi are at a high risk compared to others. Those with sunburnt that has turned into bulla are two times more likely to be under risk compared to those with no sunburnt. Scholarly works have also asserted that family history of skin cancer increases risks for individuals (WHO, 2003; Gallagher, 2005; Longo et al., 2011). Since nearly half of the nurses have had blister due to sunburnt, they are prone to risks in terms of skin cancer.

The majority of the nurses have answered the question on skin cancer correctly. However, the respondents gave less correct answers to the questions of "some viruses can

cause skin cancer", "skin cancer diagnosis can be easy", "people with more than 50 nevi are under higher risk of skin cancer" and "people with birthmark may be at risk for skin cancer". Studies on nurses and other populations have revealed that nurses and other populations have inadequate knowledge on skin cancer (Morrison, 1996; McCormick et al., 1999; Darling and Ibbotson, 2002; Halpern and Kopp, 2005; Romenzanpaur et al., 2012). Higher rate of correct answers by respondents in our study reveals that the participants have an adequate level of knowledge on the subject. However, although the nurses are not expected to have full knowledge of the risk factors of skin cancer, their inadequate knowledge provides a barrier for early diagnosis of skin cancer and for increasing public consciousness related to prevention of skin cancer.

Most of the nurses stated that they did not perceive themselves under skin cancer risk and that there was nothing that they could do to prevent skin cancer. Hall et al.(1997) found that 20.3% of the adult participants considered themselves under high risk potential of skin cancer whereas 24.8% of them did not perceive any risk potential. Mackie (2004), stated that participants of his study were worried about skin cancer. Thus, compared to other studies, the participants of the current study were less worried about skin cancer risk. This situation might stem from the relative absence of informative campaigns of media and educational institutions in Turkey for promoting consciousness related to skin cancer and negative influences of the sunlight.

The nurses' mean score of their knowledge was statistically significantly different with respect to gender. Women were more likely to report higher knowledge score than males. These results are consistent with findings of other studies (Kristijanson et al., 2004; Cinar et al., 2009; Romezanpour et al., 2012). On the contrary, Yurtseven et al. (2012) and Manne et al. (2011) have found statistically meaningful relationship between skin cancer history in family members and knowledge level. On the other hand, Darling and Ibbotson (2002), has found no significant relationship between gender and knowledge level in his study on nurses. This might be a consequence of the fact that our participants were predominantly female.

Most nurses had a good protective behavior about skin cancer. But it is insufficient for going out in midday, swimming in midday and using hat, umbrella and sun cream. WHO stated that the most important protective behaviors for skin cancer are limiting time in the midday sun (11am to 4pm), seeking shade, wearing protective clothing, wearing a hat, using sunscreen with sun protection factor (SPF) more than 15, and using sunglasses (WHO, 2003; Warren et al., 2004). Hall et al. (1997) has found that rate for usage of protective clothing and staying in shadow ranged between 28% and 32%. On the other hand, Mackie (2004) has found that one-third of the participants did not use or rarely used protective clothing and items when they were outside. He also found that rates of using hat ranged from 18% to 52%, protective clothing from 0% to 34%, and staying indoor from 11% to 32%. It might be asserted that the participants of our study have slightly higher rates in terms of usage of protective items and clothing and hat. In another study,

Darling and Ibbotson (2002) found that 57% of the nurses used sunscreen with SPF. This rate was found as 50% in the study of Saridi et al. (2009). Devos et al. (2003) found lower rates of usage of sunscreen with SPF. On the other hand Davis et al. (2002) found that rate of sun protectors was 39%. This rate was found as 26% in the study of Halpern and Kopp (2005). They also found that the rate was lower for those working outdoors (Halpern and Kopp 2005). Yurtseven et al. (2012) reported that usage of umbrella was low whereas other protective measures were high. However, Argyriadou et al. (2005) found 90% usage of sun protector items. Morrison (1996), stated that nurses felt the necessity of using sun protectors when they travelled abroad. Although the participants in the listed studies varied in terms of their educational background and professions, our study has been conducted over nurses with university degrees. This might be an explanatory factor for the differences and for more usage of some of the protective behaviors. However, it has been found that the nurses that participated in this study did not sufficiently employ protective measures, especially sunhats, umbrellas and ideal application of sunscreens. Given the fact that non melanoma skin cancer mostly develops in the faces of individuals, we might reach to the conclusion that attention should be directed to the importance of protective measures and cloths, including sunhats (Thompson et al., 1993; Phillips et al., 2000). In another study, it has been found that individuals with family history of skin cancer are more likely to take protective measures (Manne et al., 2011). As a conclusion, we have found that the nurses do not sufficiently employ protective behaviors. Hence, knowledge level of the nurses related to the influence of sun on skin and preventive measures for skin cancer has to be developed. Individual protective measures taken by the nurses who are seen as role models are crucial for their suggestions to their patients regarding protective measures against sun and skin cancer. Mortality and morbidity caused by skin cancer types, including melanoma can be significantly decreased by early diagnosis. It is our hope to increase awareness of nurses regarding the importance of protective measures against skin cancer.

In conclusion, the nurse specialist is able to offer extra support and guidance to patients who have, or have had skin cancer anywhere on their body. The nurse specialist is a qualified nurse with additional knowledge and experience, and works as part of the health care team offering advice and support to people with skin cancer at any stage of their treatment. Due to this, nurses should have sufficient knowledge of the skin cancer before anyone else.

Despite the limitations, the present study's findings suggest this nurse population lacks sufficient knowledge to understand and assess the importance of skin cancer risk. More sophisticated research and replication of the present study with other samples are needed to identify the barriers to adopting protective behavior and how best to change attitudes towards sun tanning by, identifying those at particularly high risk of developing skin cancer. In conclusion, it is thought that the results of this study may have a guiding quality for future studies.

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References

- Anthony ML (2000). Surgical Treatment of Nonmelanoma Skin Cancer. *AORN J*, **71**, 552-64.
- Argyriadou S, Makridis D, Lygidakis H, Apazidis G, Gagalis G (2005). Knowledge and behaviour of tourists towards the sun, as studied in a region of northern Greece. *Rural Remote Health*, **5**, 367.
- Armstrong BK, English DR (1996). Cutaneous malignant melanoma. In: Schottenfeld D, Fraumeni JF, eds. *Cancer epidemiology and prevention*. 2nd ed. New York, NY: Oxford University Press.
- Armstrong BK, Kricger A (1996). Epidemiology of sun exposure and skin cancer. *Cancer Surv*, **26**, 133-53.
- Centers for Disease Control and Prevention (2002). Guidelines for School Programs to Prevent Skin Cancer. *MMWR*, **5**, 1-19.
- Cinar ND, Cinar S, Karakoc A, Ucar F (2009). Knowledge, attitudes and behaviors concerning sun protection/skin cancer among adults in Turkey. *Pak J Med Sci*, **25**, 108-12
- Darling M, Ibbotson SH (2002). Sun awareness and behaviour in healthcare professionals and the general public. *Clin Exp Dermatol*, **27**, 442-44.
- Davis KJ, Cokkinides VE, Weinstock MA, O'Connell MC, Wingo PA (2002). Summer sunburn and sun exposure among US youths ages 11 to 18: national prevalence and associated factors. *Pediatrics*, **110**, 27-35.
- Devos SA, Baeyens K, Van Hecke L (2003) Sunscreen use and skin protection behavior on the Belgian beach. *Int J Dermato*, **42**, 352-6.
- Dieppen T, Mahler V (2002) The epidemiology of skin cancer. *Br J Dermatol*, **146**, 1-6.
- Gallagher R (2005) Sunscreens in melanoma and skin cancer prevention. *CMAJ*, **175**, 244-5.
- Garvin T, Eyles J (2001). Public health responses for skin cancer prevention: the policy framing of sun safety in Australia, Canada and England. *Soc Sci Med*, **53**, 1175-89.
- Geller AC, Shamban J, O'Riordan DL, et al (2005). Raising sun protection and early detection awareness among Florida high schoolers. *Pediatr Dermatol*, **22**, 112-8.
- Gies PH, Roy CR, Toomey S, McLennan A (1998). Protection against solar UV radiation. *Mutation Research*, **422**, 15-22.
- Hall HI, May DS, Lew RA, Koh HK, Nadel M (1997). Sun protection behaviors of the U.S. white population. *Prev Med*, **26**, 401-7.
- Halpern AC, Kopp LJ (2005). Awareness, knowledge and attitudes to non-melanoma skin cancer and actinic keratosis among the general public. *Int J Dermatol*, **44**, 107-11.
- Jones B, Oh C, Corkery E, Hanley R, Egan CA (2007). Attitudes and perceptions regarding skin cancer and sun protection behaviour in an Irish population. *J Eur Acad Dermatol Venereol*, **21**, 1097-101.
- Kristjansson S, Ullen H, Helgason AR (2004). The importance of assessing the readiness to change sun-protection behaviors: a population-based study. *Eur J Cancer*, **40**, 2773-80.
- Lazovich D, Choi K, Vogel RI (2012). Time to get serious about skin cancer prevention. *Cancer Epidemiol Biomarkers Prev*, **21**, 1893-901.
- Lens M, Dawes M (2004). Global perspectives of contemporary epidemiological trends of cutaneous malignant melanoma. *Br J Dermatol*, **150**, 179-85.
- Lindow K, Shelestak D (2011). Beliefs and Practices Regarding

- Skin Cancer Prevention. *Br J Dermatol Nurses' Association*, **3**, 150-5.
- Longo D, Fauci A, Kasper D, et al (2011). Skin manifestations of internal disease. Jean L. Bologna, Irwin M. Braverman (ed. Fauci). *Harrison's Principles of Internal Medicine*, 18th Edition, .
- MacKie RM (2004). Awareness, knowledge and attitudes to basal cell carcinoma and actinic keratoses among the general public within Europe. *J Eur Acad Dermatol Venereol*, **18**, 552-5.
- Manne SL, Coups EJ, Jacobsen PB, et al (2011). Sun protection and sunbathing practices among at risk family members of patients with melanoma. *BMC Public Health*, **11**, 122-32
- Marks R (1999). Two decades of the public health approach to skin cancer control in Australia: Why, how and where are we. The epidemiology of skin cancer. now? *Aust J Dermatol*, **40**, 1-5.
- McCormick LK, Mâsse LC, Cummings SS, Burke C (1999). Evaluation of a skin cancer prevention module for nurses: change in knowledge, self-efficacy, and attitudes. *Am J Health Promot*, **13**, 282-9.
- Miles A, Waller J, Hiom S, Swanston D (2005). SunSmart? Skin cancer knowledge and preventive behaviour in a British population representative sample. *Health Educ Res*, **20**, 579-85.
- Morrison G (1996). Sun exposure and skin cancer development: nurses' attitudes. *Nurs Stand*, **10**, 39-42.
- Narayaman DL, Saladi RN (2010). Ultraviolet radiation and skin cancer. *Int J Dermatol*, **49**, 978-86.
- NHS, National Institute for Health and Clinical Excellence, Skin Cancer prevention: information, resource and environmental changes, NICE public health guidance 32, Issued: January 2011 guidance.nice.org.uk/ph32.
- Phillips TJ, Bhawan J, Yaar M, et al (2000). Effect of daily versus intermittent sunscreen application on solar stimulated UV radiation-induced skin response in humans. *J Am Acad Dermatol*, **43**, 610-8.
- Ramezanpour A, Niksirat A, Golshahi RS (2013). Knowledge, attitude and behavior (Practice) toward sunscreen use among hospital personnel in comparison with Laypeople in Zanjan, Iran, *World Applied Sci J*, **22**, 683-9.
- Saraiya M, Glanz K, Briss P, et al (2004). Interventions to prevent skin cancer by reducing exposure to ultraviolet radiation: a systematic review. *Am J Prev Med*, **27**, 422-66.
- Saridi M, Pappa V, Kyriazis I, et al (2009). Knowledge and attitudes to sun exposure among adolescents in Korinthos, Greece. *Rural Remote Health*, **9**, 1162.
- Thomas D (2009). Apoptosis, UV- radiation, precancerosis and skin tumors. *Acta Med Croatica*, **63**, 53-8.
- Thompson SC, Jolley D, Marks R (1993). Reduction of solar keratoses by regular sunscreen use. *N Engl J Med*, **329**, 1147-51.
- Turkey statistical yearbook 2011, Ankara, Turkish Statistical Institute April, 2012, pp. Available online: www.turkstat.gov.tr (Accessed date 10 June 2013)
- Warren RS, Janda M, Baade PD, Anderson P (2004) Primary prevention of skin cancer: a review of sun protection in Australia and internationally. *Health Promot Int*, **19**, 369-78.
- World Health Organization 2003, Sun protection a primary teaching resource. <http://www.who.int/uv/publications/en/primaryteach.pdf> Accessed on 24 June 2013.
- Young R, Logan C, Lovato C, Moffat B, Shoveller J (2005). Sun protection as a family health project in families with adolescents. *J Health Psychol*, **10**, 333-44.
- Yurtseven E, Ulus T, Vehid S, et al (2012). Assessment of knowledge, behaviour and sun protection practices among health services vocational school students. *Int J Environ Res*