

Skin Cancer Risks and Practices of Farmers in Turkey

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Abstract

The goal of this study was to define knowledge and practices of rural farmers regarding skin cancer risks. The current descriptive study was conducted in one town of Ankara Province in August 2011. The farmers (n=110) living in Gülhüyük Town constituted the study population. The sample size was determined as 86 farmers with 95% of confidence interval and 5% of standard error. Data was collected using a questionnaire developed by the researchers. Of the farmers, 51.2% were male, and the age average was 39.33 ± 13.52 . Of the farmers, 4.6% were identified to have fair hair, 5.8% were identified to have colored eyes, 25.6% were identified to have moles on their body, and 47.7% were identified to have factors that increased skin cancer risk, such as being outdoors for more than an hour and proportionately, history of blistering sunburns. 82.6% of them expressed that they knew about harmful effects of sunrays. Although the farmers were not a high-risk group in terms of some factors such as hair and eye color that increased risk of development of skin cancer, they were exposed to risks in terms of having moles on the body, being outdoors for more than an hour, and history of blistering sunburns.

Keywords: farmer; sun protection; skin cancer; public health nurse; Turkey

Introduction

The sun regulates our planet by ensuring the sustenance of life for all living beings; however, it is also a source of energy that can have dangerous effects due to the ultraviolet light (UV) it emits (Tekbaş et al., 2005).

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Basic effects of the UV lights on human health are on the skin, among which can be listed sunburns, suntan, premature skin aging and cancer development. Ultraviolet, immune system and protective skin pigment of melanin maintain a balance in development of skin tumors. Skin cancer is frequently seen on areas of the body that are most exposed to sun, such as head, neck and hands (Kutluk and Kars, 1994).

Intensity of sunrays, proximity of location to equator, life style, occupation, clothing preference, and phenotypic characteristics are the factors that affect the harms caused by UV lights (Saraiya et al., 2004). Occupational ultraviolet exposure was first addressed at the American Conference of Industrial Hygienists at the end of the 60s (American Congress of Governmental and Industrial Hygienists, 2008). Farmers and fishermen, whose occupations require working in the sun, are at higher risk for skin cancer since they are exposed to sunlight for extended periods of time (Öztürkcan and Ermertcan, 2004; Kütting and Drexler, 2010). It is because of these factors that skin cancer is frequently seen on bodies of farmers, gardeners and fishermen working without a shirt on under the sun, and on hands and forearms of chauffeurs (Kutluk and Kars, 1994).

In a study conducted in Trabzon (2007), of 1150 cancer cases, 47.8% were seen in agricultural areas, 33.8% in forests, and 18.3% in residential areas. When the types of cancer were examined, skin cancer (12.3%) was found to be the second most common cancer (Çolak and Yomralıoğlu, 2007). The incidence of skin cancer is 0.8% among the general population in Turkey. The incidence and mortality of skin cancer are 0.6% and 0.4% respectively among men, and 1.0% and 0.7% respectively among women (Globocan, 2008).

Institutions such as the World Health Organization, the World Meteorological Organization, the United Nations Environment Programme (1995) have adopted decisions concerning the necessity of warning and educating the public about the dangerous effects of UV light (UNEP, 2002). Many studies have been conducted in various countries with the aim of determining the effects of sunlight on the skin, the level of awareness among the public about skin cancers and common practices of sun protection. Educational campaigns have been held for the prevention of skin cancers (Laborers' Health and Safety Fund of North America, 2005; OHSCC, 2008; Cancer Council Victoria, 2009). Nurses play a key role in these campaigns since the responsibility for public education and counseling falls on them.

Nurses are also charged with screening for the prevention and early diagnosis of skin cancer (Robinson et al., 2004).

According to the 2011 statistics of the Turkish Statistics Institute (TSI), approximately 26% of approximately 25 million of the employed workforce in our country constitute the agrarian workforce (Turkish Statistics Institute, 2011). Compared to many occupational groups working in open field, farming folks are faced with dermatological problems due to exposure to chemical agents, pesticides, sun rays, with musculoskeletal problems due to poor body posture and working with dangerous agricultural machines, and with other health risks due to constant exposure to dust-dirt, excessive heat-cold, unfavorable living conditions and habitation conditions (Susitaival et al. 2004; Kolutek and Karataş 2007; Mills et al. 2009; Şimşek, 2012). It is unfortunately hard to prevent farmers' exposure to sun due to available conditions in their working environment. Therefore, health care workers must provide the individuals in this group with counseling on hazards of sun, and protection methods, and organize health trainings on importance and early diagnosis of risk factors for primary protection (Robinson et al., 2004).

Education, the implementation of the acquired knowledge, and the modification of behavioral patterns are all doubtless very important for protecting people from the dangerous effects of sun. It is possible to protect oneself from or at least minimize the early and late effects of ultraviolet light exposure (Glanz et al., 2007). Protection from dangerous effects of sun requires taking various measures, the most important of which is proper clothing. Wearing hats with a wide brim, tightly woven and lightly colored garments, and sunglasses are needed for protection from sun. The most fundamental rule of protection is to avoid sunlight from 10:00 a.m. to 4:00 p.m. when it is most intense. Everybody needs protection during summer. However, people with higher risk occupations such as farmers, fishermen, construction workers as well as people with high risk skin types should be especially careful to use protection products that reduce the dangerous effects of sunlight (Kütting and Drexler 2010; Robinson et al., 2004; Gaetano et al., 2009). The region ranking fifth in Turkey that gets most sunlight is the Central Anatolia Region, and Ankara gets daily average of 6 hours and 54 minutes of sunlight. When the land distribution of Ankara Province is reviewed, half of its surface is dedicated to cultivated fields (vegetable gardens, orchards, fallow lands, cultivated fields and vineyards (Turkish Ministry of Agriculture, 2006).

From this perspective, it is believed to be important to investigate the knowledge and practices of individuals, who are exposed to sun rays for extended hours due to their occupation and earn their subsistence by farming, regarding harmful effects of sun rays. In the literature, although an example of intervention study with a higher proof level conducted on the farmers in the Marmara region (Tuna Malak et al., 2011) is seen, no descriptive study has been detected in the subject for the Central Anatolia Region. At this point, the current study was believed to serve as guidance for possible future interventional studies. This study was conducted to define knowledge and practices of farmers regarding harmful effects of sunrays and protection against them, and to investigate the factors increasing their skin cancer risk.

Materials and Methods

The descriptive study was conducted in Gölhüyük Town of Şereflikoçhisar Subprovince of Ankara Province in August 2011. As a result of the preliminary research, it was identified that the individuals engaged in farming occupation due to large lands and cultivated field lived in the town, and the town was therefore determined as the study population. The town chief was referred to determine the study population. The farmers who lived in Gölhüyük Town and were between the ages of 17-72 (n=110) constituted the study population. The study sample was selected by taking into consideration that the entire study population could not be reached because the farmers would leave the town for seasonal work opportunities. The sample size was calculated with proportional sampling method of the known population and determined as 86 farmers with 95% of confidence interval and 5% of standard error (Karataş, 2012). On the dates when the study data was collected, 86 farmers who could be reached and voluntarily participated in the study constituted the study sample.

Data was collected by the researchers using a questionnaire (35 close-ended and 2 open-ended questions) that was developed in line with the literature (Robinson et al., 2004; Susitaival et al., 2004; Tuna Malak et al., 2011; Schenker et al., 2002) The form is comprised of three sections. Section one investigated socio-demographic characteristics of the farmers (5 close-ended and 2 open-ended questions); section two investigated their knowledge of risk factors of skin cancer (6 questions), and of sunrays and its health effects (8 questions); and section three investigated their knowledge of sun protection practices (3 questions) and frequency thereof (13 questions). Data was collected by 25-minute-face-to-face interview method.

The questions' clarity was tested by conducting a pilot study on a group of 10 individuals. No suggestion was received about the questions. The farmers were asked to rate their knowledge of health effects of sun rays by marking the most applicable category expression from "yes, no, I don't know". The farmers were asked to rate frequency of their practices for sun protection by marking the most applicable expression from "always, frequently, rarely, never".

The SPSS 16.0 software package was used to analyze (numeric, percentage, mean) the data. Agencies such as United Health Care Services (2012), United States Environmental Protection Agency (2013), and World Health Organization (2014) report that long-term exposure to UV radiation can lead to cataracts and other eye disorders furthermore thicker epidermis and skin cancer Therefore, the current study investigated the correlation between skin thickening knowledge and sun protection use, and eye disorders knowledge and sunglasses use behavior. Pearson's chi square test was used in the analyses. The significance level was determined as $p < 0.05$ in the current study.

Results

51.2% of the farmers were male; their age groups were 16-19 (7.0%), 20-29 (26.7%), 30-39 (20.9%), 40-49 (24.4%), 50-59 (14.0%), and 60 and above (7.0%); and the age average was 39.33 ± 13.52 . Their education levels were 0-7 years (33.7%) and 8 years or above (66.8%). 65.1% of the farmers reported that their income was equal to their expenses, 25.6% reported that their income was less than their expenses, and 9.3% reported that their income was more than their expenses. 61.5% of the farmers were identified to have social security, and the remainder was identified to lack social security. The average amount of working time that the farmers were exposed to sun in one work day is 3.6 ± 1.12 .

The factors increasing farmers' development of risk cancer are provided in Figure 1. All of the farmers stated that they did not have skin cancer history in their family.

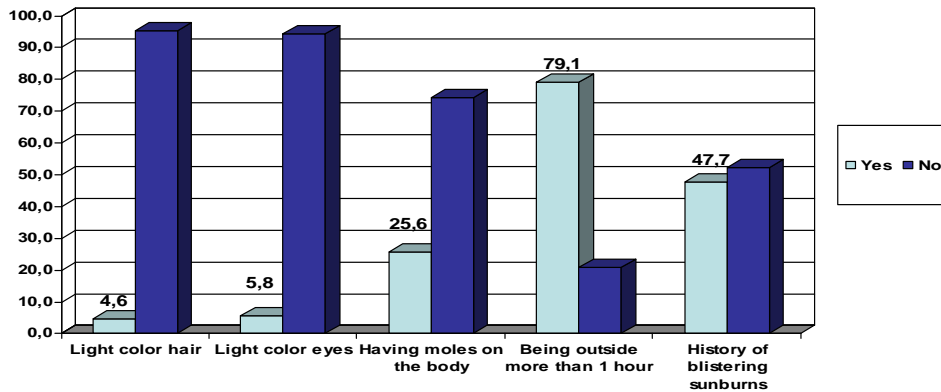


Figure 1. The factors increasing farmers' development of risk cancer

82.6% of the farmers stated that they knew harmful effects of sunrays, and the remainder stated that they did not. When they were asked about the hours when the sunrays were harmful, 89.5% replied as "between 10:00-16:00". The farmers reported their working hours as before 10:00 (59.3%), between 10:00-16:00 (34.9%), and after 16:00 (5.8%). 74.4% of the farmers stated that they were knowledgeable about protection against harmful effects of sunrays. The portion of the farmers who believed that sun protection was necessary was 83.7%. The farmers' sources of information for the effects of sun rays and for sun protection were identified to be, in respective order, television (54.6%), internet (17.5%), family (11.6%), friends (9.3%), and newspapers (7.0%).

In Table 1, farmers' knowledge of health effects of sunrays is given. When the table is reviewed, more than 80.0% of the farmers are observed to know that the sun causes "development of sunspots and freckles", "skin cancer", "premature skin aging", and "allergic reactions on the skin". 50.0% of the farmers were identified to know that sunrays caused skin thickening, and 46.5% to know that sunrays caused eye disorders (Table 1).

Table 1: Farmers' Knowledge of Health Effects of Sunrays

<i>Statement regarding effects of sunrays</i>	Yes		No		Don't know	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Sunrays caused development of sunspots and freckles	75	87,2	4	4,7	7	8,1
Sunrays cause skin thickening	43	50,0	14	16,3	29	33,7
Sunrays cause skin cancer	75	87,2	2	2,3	9	10,5
Sunrays cause allergic reactions on the skin	78	90,7	2	2,3	6	7,0
Sunrays cause premature skin aging	68	79,1	7	8,1	11	12,8
Sunrays caused eye disorders	40	46,5	6	7,0	40	46,5

In Table 2, farmers' practices and frequency thereof for sun protection are given. It was identified that the farmers had "never" used sunscreen (73.2%), and sunglasses (68.6%). When their practices for sun protection are reviewed; it is seen that 65.1% of the farmers "always" prefer shade that 59.3% try to cover their face-neck and hands, 68.6% prefer clothes covering arms and legs, that 53.5% wear gloves, and that 66.3% have a daily water intake of minimum 8-10 glasses (Table 2).

Table2: Farmers' PracticesandFrequencyThereoffor Sun Protection

Frequency of practice Practices	Always		Often		Rarely		Never	
	n	%	n	%	n	%	n	%
I try not to work at 10.00a.m.-16.00p.m. when working in farm	41	47,7	17	19,8	11	12,8	17	19,8
I prefer shade when working in farm	56	65,1	15	17,4	11	12,8	4	4,7
I wear a wide brimmed hat when working in farm	32	37,2	14	16,3	19	22,1	21	24,4
I wear sunglasses when working in farm	8	9,3	3	3,5	16	18,6	59	68,6
I wear dark clothes when working in farm	7	8,1	5	5,8	21	24,4	53	61,6
I try to close my face, neck, and hands when working in farm	51	59,3	7	8,1	15	17,4	13	15,1
I try to wear clothes that cover the arms and legs when working in farm	59	68,6	9	10,5	16	18,6	2	2,3
I use tractor with seat canopy when working in farm	36	41,9	8	9,3	13	15,1	29	33,7
I work shirtless in the farm	5	5,8	3	3,5	17	19,8	61	70,9
I wear loose fitting and tightly woven clothes when working in farm	25	29,1	13	15,1	14	16,3	34	39,5
I wear gloves when working in farm	46	53,5	6	7,0	26	30,2	8	9,3
I use sunscreen when working in farm	3	3,5	1	1,2	19	22,1	63	73,2
I drink at least 8-10 glasses of water a day	57	66,3	13	15,1	15	17,4	1	1,2

In Table 3, some of the knowledge of farmers of health effects of sunrays and their replies on practices for protection against such effects of the sun is seen. Although 45.6% of the farmers (n:40) knew that the sun caused eye disorders, 60% of this group were identified not to wear sunglasses while working in the field. A statistically significant difference was identified between the groups during the analysis ($X^2=10,04$, $p<0.05$) (Table 3). It may be said that this difference was caused by the group who expressed that they knew the sun caused eye orders and who however did not use sunglasses. Similarly, although half of the farmers (n:43) knew that sun rays caused skin thickening, they were identified to never (60.5%) use sunscreen while working in the field , and the statistically significant difference was believed to be caused by this group ($X^2=8,50$, $p<0.05$) (Table 3).

Table3: Some of the Knowledge of Farmers of Health Effects of Sunrays and Their Replies on Practices for Protection Against Such Effects of the Sun

Farmers' knowledge of health effects of sunrays		Sun Protection Practices							
		I wear sunglasses when working in farm							
		Always-Often		Rarely		Never			
		n	%	n	%	n	%	Total	
Sunrays caused eye disorders	Yes	10	25	6	15	24	60	40 (100,0)	$\chi^2=10,04$
	No	1	2,2	10	21,7	35	76,1	6 (100,0)	$p=0,007$
I use sunscreen when working in farm									
Sunrays cause skin thickening	Yes	4	9,3	13	30,2	26	60,5	43 (100,0)	$\chi^2=8,50$
	No	0	0	6	14	37	86	14 (100,0)	$p=0,014$

Discussion

According to the literature, individuals with fair skin, several moles and sunspots on the skin, exposed to sun for extended periods, and with history of sunburns have higher risk of developing skin cancer (Armstrong and Kricger, 2001; Tüzün et al. 2008). It was thought that although the farmers participating in this study had a lower rate of fair hair and colored eyes, they were exposed to a high risk in terms of other risk factors such as existence of moles on the skin, being outdoors for more than an hour and history of blistering sunburns. The study conducted by McCool et al. (2009) on the workers in different occupation group working outdoors, reported that the relationship of more correct knowledge of harmful effects of the sun, sun protection at work, and use of sunscreen with individual risk factors was effective. Therefore, the farmers who are particularly exposed to high risk must first be made sensitive about their risk exposure for skin cancer protection. It is believed that the individuals' awareness of their risk exposure in their current conditions may prove effective in protection and precaution.

It is pleasing to see that majority of the farmers correctly know about the hours when the sunrays peak as between 10:00-16:00. However, although they know the hours when to avoid the sun, it is curious to see an un-under estimable portion of the farmers (34.9%) report that they work during between 10:00-16:00.

Professions performed outdoors are under the threat of the ultraviolet lights, an unnoticed risk due to inherent characteristics of the work performed (Girgis et al. 1994; Batra, 2011). Therefore, it will prove effective for reducing the risk that the individuals in such profession groups be made aware of protection strategies and that they apply these strategies in their daily work life (Batra, 2011).

More than half of the farmers were identified to both know about harmful effects of sunrays and find sun protection necessary. The farmers in Ontario, Canada reported that they knew the importance of sun protection, and that however, sun protection was a health issue not fully understood by their colleagues (Ing et al., 2002). The current study drew attention to the parallelism between the fact that the farmers knew about sun protection and the fact that they found it necessary, and revealed the relationship between knowing the harms and finding protecting important.

The first three of the farmers' sources of information for effects of sunrays and sun protection were identified to be television, Internet, and family. Today, mass media are among the top basic sources of information of many people on their lives. 48.9% of the population in Turkey use Internet (Turkish Statistics Institute, 2013). The average amount of time that farmers spend viewing television during weekdays is 3 (RTUK, 2013). Among mass media, particularly television prevails due to its accessibility to large crowds as well as due to accessibility of all walks of life to it. It is of no coincidence that television was identified to be the first reference source of information in this study

A large majority of the farmers were identified to know that the sun caused "development sunspots and freckles", "skin cancer", "premature skin aging", and "allergic reactions on the skin". However, although the farmers seemed to be knowledgeable about the effects of sunrays, the number of the farmers who knew about the important effects of sunrays, eye disorders and skin thickening, is limited to half of the participants. While the study conducted by Tuna Malak et al. (2011) reported that a very few farmers (1.9%) were knowledgeable about harmful effects of the sun, a study conducted in similar way by Çınar et al. (2009) on individuals from different age groups identified that the participants' knowledge was inadequate.

What is most remarkable about the farmers' practices for sun protection is the findings that they reported that they had "never" used sunscreen and sunglasses.

Whereas, use of sunglasses and sunscreen are reported in the literature to be important practices because they both reduce the harms caused by the sun both on the entire body and particularly on the skin surrounding the eyes, and reduce risk of development of cataract in the eye (Glanz et al., 2001). Findings reveal a contradiction between the farmers' knowledge and practices. Although the farmers reported that they were knowledgeable about harmful effects of the sun, their protection behavior in this respect is inadequate. Only half of the farmers know the sun causes skin thickening, use of sunscreen is low, as expected. Similarly, less than half of the farmers knew that the sun caused eye disorders, use of sunglasses was found low. It is remarkable that especially use of sunscreen and sunglasses by the farmers is very low. This result gave rise to the thought that this might be associated with the fact that only 10% of the farmers made more income than expenses, i.e. with an overall low economic purchasing power. Protection measures such as sunscreen and sunglasses may be thought to be inaccessible products for the participants in this study due to their being expensive practices.

The findings that more than half of the farmers "always" preferred shade, tried to cover their face-neck and hands, preferred clothes covering arms and legs, wore gloves, and had a daily water intake of minimum 8-10 glasses are favorable. In the literature, what prevents practices such as wearing long-sleeved clothes, gloves and trousers is reported to be very hot weather. Parrott et al. (1996) also identified the reason why the farmers did not wear protective clothing as hot weather. It is pleasing to see in the current study that more than half of the farmers perform correct, easy and viable practices such as looking for shade, wearing protective clothing. In addition, the farmers were observed to be adequately sensitive about large water intake to prevent dehydration.

When among the practices for sun protection, use of wide-brimmed hat and tractor with seat canopy are reviewed, it is curious to see that the number of the farmers who "always" perform these two important practices are close to that of the farmers who "never" do so. While Turkey demonstrates regional variations, there are protective practices by the farmers, such as wearing colored head covers, veils, muslin head covers, and head wrap, instead of using hats. While these practices are favorable, they prove to be inadequate as they fail to adequately protect body regions having skin cancer risk (eye, face, and nape).

While no information was obtained regarding Turkish farmers' behavior in this respect, it was reported in the literature that American farmers "rarely" or "never" applied precautions to reduce sun exposure, such as wearing wide-brimmed hats, using sunscreen and wearing long-sleeved t-shirts (Parrott et al., 1996; Marlenga, 1995). Similarly, Salas et al. (2005) reported that Latino farmers did not use hats, but wore long-sleeved clothes. When it is considered that non-melanoma skin cancers develop frequently on the face, the farmers particularly need be informed of the importance and benefits of wearing hats. Also, the study conducted by Susitaival et al. (2004) identified that the farmers cropping in the field used tractors with seat canopy more than those engaged in other activities, which was associated with the low incidence of skin cancer in the farmers cropping in the field. Results reveal that attention must be drawn to use of hats and tractors with seat canopy. Taking into consideration the economic conditions of Turkey, it is believed that, although use of tractors with seat canopy is an expensive practice, as human health is in question, it is important to raise employers' sensitivity regarding the issue and farmers' awareness about their risk exposure.

It was identified that although approximately half of the farmers knew that sunrays caused eye disorders, they mostly did not wear sunglasses while working in the field. Similarly, it was identified that although half of the farmers knew that sunrays caused skin thickening, they never (60.5%) used sunscreen while working in the field. Findings revealed the inadequacy of the health development behavior for protection behavior against skin thickening and eye disorders, such as wearing sunglasses and protecting the exposed areas of the body from the sun. Also, these findings are remarkable in terms of theoretical approaches revealing the relationship between knowledge, beliefs, attitudes and behavior regarding health development behavior.

Conclusion and Suggestions

It was identified that although the farmers were not a high-risk group in terms of some factors such as hair and eye color that increased risk of development of skin cancer, they were exposed to risk in terms of having moles on the body, being outdoors for more than an hour, and history of blistering sunburns. More than half of the farmers reported that they were aware of harmful health effects of sunrays.

However, the farmers were found to fail in protective practices against harms of sunrays, such as wearing hat or sunglasses, using sunscreen and driving tractors with seat canopy. Results reveal that there is a contradiction between the farmers' knowledge and practices.

Farmers spend most of their time on the field and on open areas due to their occupation. Therefore, it is important to raise their awareness about protection against sunrays. Preventive services under the scope of the current health system in Turkey are offered in family and community health centers and authorized common health and safety units, or workplace and school infirmaries. Occupational Health and Safety Law No. 6331 holds the employers responsible for activities such as risk evaluation, occupational risk prevention, providing training and information. It is important that certified workplace nurses be assigned to play an active role in introducing health behavior for sun protection to the farmers. In our country's current conditions, the following are recommended to develop the farmers' behaviors for protection against sunrays.

- The health personnel working in primary care institutions must offer health trainings to the farmers to raise their awareness of protective practices such as wearing sunglasses and hats, covering body parts exposed to sun (face, neck, hand, etc.)
- Taking into consideration the socio-economic levels and social security characteristics of the farmers in rural areas of our country, sunscreen such as sun protection lotion, protective sunglasses must be offered to the farmers under the social security coverage.
- The farmers must be monitored for skin cancer under the scope of the protocol signed between the Ministry of Labor and Social Security and the Ministry of Food, Agriculture and Livestock (19/03/2013).

Ethical Considerations

To conduct the study, the approval of the Ethics Committee of School of Nursing of Ege University was obtained in writing, and the farmer's verbal consent was obtained. Among the major restrictions of the study are that it was conducted with a few numbers of farmers only in one town, that the data was collected based on the individuals' self-reporting, and that the results could be generalized only to this group.

Conflict of interest The authors declare that they have no conflict of interest.

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References

- American Congress of Governmental and Industrial Hygienists (2008). Threshold limits values and biological exposure indices. Cincinnati: ACGIH, Congress Book:256
- Armstrong BK, Kricger A (2001). The epidemiology of UV induced skin cancer. *J Photochem Photobiol*, 63:8-18.
- Batra T (2011). The invisible risk of Ultraviolet rays at outdoor workplaces. *Int J of Environmental Sciences*, 2(1):73-78.
- Cancer Council Victoria (2009). Skin cancer and outdoor work: a guide for employers. The State of Queensland.
http://www.sunsmart.com.au/downloads/resources/booklets/skin_cancer_outdoor_work_booklet.pdf 05 May 2014
- Çınar ND, Çınar S, Karakoç A, et al. (2009). Knowledge, attitudes and behaviors concerning sun protection/ skin cancer among adults in Turkey. *Pak Med J Sci*, 25:108-12.
- Çolak E, Yomralıoğlu T. (2007). Kanser vakalarının coğrafi bilgi sistemleri ile irdelenmesi: Trabzon örneği (Examination of cancer cases with geographical information systems: the case of Trabzon). *Jeodezi, Jeoinformasyon ve Arazi Yönetimi Dergisi*, 96:23-66 (in Turkish).
- Gaetano DE, Hodge B, Clark A, Ackerman S, Burdick P, Wranesh Cook ML (2009). Preventing skin cancer among a farming population Implementing Evidence Based Interventions. *AAOHN*, 57(1):24-31.
- Glanz K, Maddock JE, Lew RA, et al. (2001). A randomized trial of the Hawaii SunSmart program's impact on outdoor recreation staff. *J Am Acad Dermatol*, 44:973-978.
- Glanz K, Buller DB, Saraiya M (2007). Reducing ultraviolet radiation exposure among outdoor workers: State of the evidence and recommendations. *Environ Health*, 6:22-32, doi:10.1186/1476-069X-6-22.
- Girgis A, Sanson-Fisher RW, Watson A (1994). A workplace intervention for increasing outdoor workers' use of solar protection. *Am J Public Health*, 84(1):77-81.
- Globocan (2008). Cancer incidence, mortality and prevalence worldwide in 2008. Retrieved: 05.08.2013, from <http://globocan.iarc.fr/factsheet.asp>
- Ing SY, Ashbury FD, Marrett LD, Perry KV (2002). Use of focus group methodology in the development of an Ontario farmers' sun safety survey. *Chronic Dis Can*, 23: 65-70.
- Karataş N (2012). Araştırmada örnekleme (Research Sampling). İ. Erefe (Ed.), *Hemşirelikte araştırma ilke süreç ve yöntemleri (Research Principles, Processes and Methods in Nursing)*, İstanbul: Odak Ofset :125-138 (in Turkish).
- Kolutek R, Karataş N (2007). Nevşehir İli Uçhisar kasabasında yaşayan bireylerde kanser risk faktörleri ve erken tanı belirtilerinin saptanması (Determination of Cancer Risk Factors and Early Diagnosis Symptoms in the Residents of Uçhisar Town of Nevşehir Province). *Sağlık Bilimleri Dergisi*, 16(1):28-29 (in Turkish).

- Kutluk T, Kars A (1994). Kanser Konusunda Genel Bilgiler, T.C Sağlık Bakanlığı Kanser Savaş Daire Başkanlığı Türk Kanser Araştırma ve Savaş Kurumu Yayını (General Information on Cancer, Turkish Ministry of Health, Cancer Prevention Department, Turkish Cancer Research and Prevention Agency Publication), Ankara, 57 (in Turkish).
- Kütting B, Drexler H (2010). UV-induced skin cancer at workplace and evidence-based prevention. *Int Arch Occup Environ Health*, 83:843-854.
- Laborers' Health and Safety Fund of North America (2005). Life lines online Prepare for summer Construction Season with LHSFNA Sun sense campaign. <http://www.lhsfna.org/index.cfm?objectID=F471D736-D56F-E6FA-95A7E0456494B9F5> 05 May 2014
- Marlenga B (1995). The health beliefs and skin cancer prevention practices of Wisconsin dairy farmers. *Oncol Nurs Forum*, 22, 681-686.
- McCool JP, Reeder AL, Robinson EM, Petrie KJ, Gorman DF (2009). Outdoor workers' perceptions of the risks of excess sun exposure. *J Occupational Health*, 51(5), 404-411.
- Mills PK, Dodge J, Yang R (2009). Cancer in migrant and seasonal hired farm workers. *J of Agromedicine*, 14, 185-191.
- Ministry of Labor and Social Security, 2012. 6331 sayılı İş Sağlığı Ve Güvenliği Kanunu (Ministry of Labor and Social Security (2012) Occupational Health and Safety Law No. 6331). http://www.csgeb.gov.tr/csgebPortal/ShowProperty/WLP%20Repository/csgeb/dosyalar/kitap/kitap03_6331 21 May 2014
- Ministry of Labor and Social Security (2013). Tarımda İş Sağlığı ve Güvenliği Protokolü. The Protocol on Occupational Health and Safety in Agriculture 19.03.2013). <http://www.csgeb.gov.tr/csgebPortal/isggm.portal?page=haber&id=tarim> 21 May 2014
- Occupational Health & Safety Coordinating Committee (OHSCC) (2008). Sun protection policy. <https://wx.toronto.ca/intra/hr/policies.nsf/9fff29b7237299b385256729004b844b/c9407c59f7dda21485256b4300737cb5?OpenDocument> 21 May 2014
- Öztürkcan S, Ermertcan AT (2004). Güneş Koruyucuları (Sun Protection Products). *Kozmetoloji Dergisi*, 5(4), 12-13 (in Turkish).
- Parrott R, Steiner C, Goldenhar C. (1996). Georgia's harvesting healthy habits: A formative evaluation. *Journal of Rural Health*, 12: 291-300.
- Robinson JD, Silk KJ, Parrott RL, Steiner RN, Morris SM, Honeycutt MA (2004). Healthcare providers' sun-protection promotion and at-risk clients' skin cancer prevention outcomes. *Preventive Medicine*, 38: 251-157.
- RTUK (2013). Televizyon izleme eğilimleri araştırması, 2012 (Research on television viewing tendencies, 2012). http://www.rtuk.org.tr/sayfalar/IcerikGoster.aspx?icerik_id=95dd9280-77b3-4225-9649-37da1a6c0b94) 21 May 2014
- Salas R, Mayer JA, Hoerster KD (2005). Sun protective behaviors of California farmworkers. *J Occup Environ Med*, 47:1244-1249.
- Saraiya M, Glanz K, Briss PA, et al. (2004). Interventions to prevent skin cancer by reducing exposure to ultraviolet radiation: a systematic review. *Am J Prev Med*, 27:422-466

- Schenker MB, Orenstein MR, Samuel SJ (2002). Use of protective equipment among California farmers. *Am J of Ind Med*, 42:455-464.
- Susitaival P, Beckman R, Samuel SJ, Schenker MB (2004). Self reported dermatitis and skin cancer in California Farm Operators. *Am J of Ind Med*, 46:136-141.
- Şimşek Z (2012). Mevsimlik tarım işçilerinin ve ailelerinin ihtiyaçlarının belirlenmesi araştırması 2012 (Research on Determining Needs of Seasonal Agricultural Workers and Their Families, 2012). 1. Baskı, Damla Matbaacılık Ltd.Şti. Ankara, 18.
- Tekbaş ÖF, Evcı D, Özcan U (2005). Yaklaşan Yaz Mevsimi ile Artan Bir Tehlike: Güneş Kaynaklı Ultraviyole Işınları (An Impending Danger with the Nearing Summer Season: Ultraviolet Lights Originating from Sun). *TSK Koruyucu Hekimlik Bülteni*, 4(2):98-107(in Turkish).
- Tuna Malaka, Yıldırım P, Yıldız Z, Bektaş M (2011). The Effects of the training about skin cancer on farmers' knowledge level and attitudes. *Asian Pacific J of Cancer Prevention*,12(1): 117-20.
- Turkish Statistics Institute (TSI 2011). Hanehalkı İşgücü İstatistikleri (Household Workforce Statistics,2011). (http://www.tuik.gov.tr/PreHaberBultenleri.do?id=10761&tb_id=2 2 May 2014
- Turkish Ministry of Agriculture and Rural Works, Strategy Development Department (2006). Ankara Tarım Master Planı. (Ankara Agricultural Master Plan) (http://www.agri.ankara.edu.tr/fcrops/1289_ANKARA_TARIM_MASTER_PLANI.pdf) 27 April 2014
- Turkish Statistics Institute (TSI 2013) Bilgi Toplumu İstatistikleri (2004-2013). Girişimlerde Bilişim Teknolojileri Kullanımı Araştırması, Hanelerde Bilişim Teknolojileri Kullanımı Araştırması (16-74 yaş arası bireyler) (Research on Use of Information Technologies in Enterprises, Research on Use of Information Technologies in Households (individuals between the ages 16-74). (http://www.tuik.gov.tr/PreTablo.do?alt_id=1028) 24 May 2014
- Tüzün Y, Gürer MA, Serdaroğlu S, Oğuz O, Aksungur VL (2008). Dermatoloji (Dermatology). Cilt 2. 3. Baskı, Nobel Tıp Kitapevleri, İstanbul:1775-84.
- United Healthcare Services (2012). Did you know that the sun's rays can damage your eyes? (http://www.uhc.com/live/uhc.com/Assets/Documents/B2H_UVRadiation.pdf) 14 April 2014
- United States Environmental Protection Agency (2013). Prevent Eye damage, Protect Yourself from UV Radiation. (<http://www.epa.gov/sunwise/doc/eyedamage.pdf>) 21 January 2014
- UNEP (2002). Global solar UV index: a practical guide. (www.unep.org/PDF/Solar_Index_Guide.pdf) 21 May 2014
- World Health Organization (2014).The known health effects of UV. (<http://www.who.int/uv/faq/uvhealthfac/en/index.htmlsunmart>) 21 April 2014