Original Article

Knowledge, Attitude, and Practice of Adults to the Protective Actions against Sun in Northwest Tehran, Iran

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Abstract

Background: Wrong beliefs about risky actions such as sunbathing and tanning are common due to media advertisements or general lack of knowledge. This work has focused on the knowledge and attitude of a group of citizens in Tehran, Iran and the protective actions they take regarding undesirable effects of the sun.

Methods: A descriptive-analytic cross-sectional study has been conducted on 400 randomly selected individuals from the citizens of Shahrak-E-Gharb, an area in northwest Tehran. A questionnaire comprising 24 questions including demographic information, individuals' knowledge about sun exposure, and their opinions and behaviors on protective actions towards solar radiation were used to assess study objectives. Crude and adjusted odds ratios and 95% confidence intervals for socio-demographic factors were calculated through univariate and multivariable logistic regression.

Results: The majority of participants had good knowledge about sun protective behaviors. Knowledge about sun exposure duration and tanning was higher among women and those with higher education. As for attitude, only 15% were concerned about skin cancer and 61.8% thought skin cancer can be prevented by sun protection. Higher education was associated with a more positive attitude towards tanning. Among respondents, 41% had suitable clothing to protect themselves against sun burn and only 32% used sunscreen most of the time. University graduates had significantly better practice towards using sunscreen cream compared to high school graduates.

Conclusion: Although our study sample possessed good knowledge towards sun protection, their attitude and practices were unsatisfactory. Thereby, they need to be informed and educated as how to be safely protected against excessive sun exposure.

Keywords: attitude, knowledge, practice, sun harm, sun protection

Introduction

Sunlight is an important source of energy and assists humans with its beneficial effects.[1] It has a wide spectrum of electromagnetic radiation including visible light, infrared and ultraviolet rays.[2] The skin effect of ultraviolet radiation is divided into two categories: i) short term effects of tanning, vitamin D production, redness, sun burn and ii) long term effects that include lentigo, actinic keratosis, basal cell carcinoma (BCC), squamous cell carcinoma (SCC), melanoma, skin aging, and telangiectasia.

Skin cancer is known as one of the most prevalent cancers worldwide[3]; countries such as England and the USA have the highest rates of skin cancer.[4–7] More than fifty thousand people worldwide die from skin cancer annually.[8] Based on conducted surveys, the prevalence of skin cancer follows an increasing trend worldwide[9] and has become an epidemic.[10]

Moreover, exposure to ultraviolent radiation causes cell burning and premature skin aging[11]; therefore, mortality, morbidity and the economical harms, which result from this damage are substantial.[8] There is also a study, which refers to the increased percent of youth mortality caused by skin cancer.[12]

As a result, studying the different ways of skin protection as well as the ways of decreasing risk factors that can cause skin cancer have attracted a considerable attention in among health researchers.[8] Notably, wrong beliefs such as sun bathing and other actions that cause increased skin exposure to sunlight are classified as the most basic preventable risk factors.[13]

Recently, light protection has become a major topic of many dermatology articles. It is based on two factors: i) physical protecting of the skin (e.g., appropriate clothing), chemical protecting and sunscreen creams, and ii) decreasing risky behaviors as much as possible.[2] Since the most important cause of skin cancer is inappropriate or risky behaviors such as tanning and sunbathing,[14] it is necessary

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Accepted for publication: 20 November 2010

to assess (estimate) the behavior of the study population to evaluate the risk rate.[7]

Personal behavior is a result of one's knowledge, attitudes and beliefs; therefore, lack of knowledge (unawareness) and wrong beliefs can lead to inappropriate behavior.[2]

Hence, the goal of this survey is to investigate the knowledge, attitudes, and behavior of adults who live in northwest Tehran in relation to protective actions against sun exposure.

Materials and Methods

This is a descriptive-analytic cross-sectional study conducted on residents of Shahrak-E-Gharb in western Tehran, a high socio-economic area in northwest Tehran. A total of 400 individuals were included in this study. Participants were those who referred to public places such as: super markets, parks, cinema, shopping centers, etc. at different hours (morning and evening). These places were chosen based on their accessibility and the assumption that the participants would be a representative random sample of residents.

Data was collected using a questionnaire that comprised 24 questions including demographic information, individual's knowledge about sun exposure, their opinions towards sun exposure and their behaviors on protective procedures towards solar radiation. The content validity of questionnaire was confirmed by review of the relevant literature and consultation with two dermatologists. The reliability was verified through Cronbach alpha coefficient for knowledge and attitude (alpha=0.70) and Kappa statistic for practice (K=0.75).

Assessing knowledge

The population's knowledge about sun exposure was measured by six questions: the adverse effects of sun exposure on skin, necessity of skin protection towards sun radiation, effect of sun exposure duration on skin damage, necessity of skin protection in children towards solar radiation, risk of tanning and necessity of skin protection in men. The questions were scored on a five point Likert scale (1 – 5 with five being assigned to the best possible answer) ranging from completely agree (score of five) to completely disagree (score of one).

Assessing attitude

There were five questions regarding the population's attitude towards skin protection from solar radiation. In question one, we asked about individuals' opinions on tanning, and the answers ranged from 'it makes me look very attractive' (score of one) to 'it does not make me look attractive at all' (score of five). Individuals were asked how difficult they think sunscreen cream usage is. The answers ranged from 'very difficult' (score of one) to 'very easy' (score of five). The third question was: "How probable is the risk of skin cancer?" The answers ranged from 'very probable' (score of five) to 'not at all probable' (score of one). In question four we asked how much they were concerned about skin cancer. The answers were from 'not at all' (score one) to 'very much concerned' (score five). In the final question, we asked if they thought harmful sun exposure can be avoided by personal protection. The answers were from 'not at all' (score one) to 'very much' (score five).

Assessing practice

Five questions were used to assess individual practices regarding sun protection. In the first question participants were asked about the daily amount of time they were exposed to sunlight; the answers ranged from 'less than half an hour' (score five), '0.5 – 1 hour' (score four), '1 – 3 hours' (score three), '3 – 6 hours' (score two) and 'more than 6 hours' (score one). The second question asked about the history of sun bathing during the past year of which the answers ranged from 'never' (score five), 'five times or less' (score four), '6 – 15 times' (score three), '16 – 25 times' (score two), and 'more than 25 times' (score one). In question three participants were asked about tanning history during the past year; the answers were from 'never' (score five), 'once' (score four), 'twice' (score three), 'three times' (score two), and 'more than three times' (score one). Question four asked about participants' clothing as a protection against sun (wearing hats or long-sleeve clothes); the answers ranged from 'always' (score five), 'often' (score four), 'sometimes' (score three), 'seldom' (score two), and 'never' (score one). Finally, participants were asked about the use of sunscreen creams as a protection against sun exposure and the answers were scored as in question four.

Residents who used sunscreen creams were questioned about the type of cream and its SPF.

Statistical analysis

Questions of each domain were individually dichotomized as 1 (scores 4, 5) and 0 (scores: 1, 2, 3). The univariate effect of socio-demographic factors on each question was assessed through crude odds ratios and 95% confidence intervals using logistic regression. We then used multivariable logistic regressions to assess the adjusted odds ratios using the forward likelihood ratio method to select the best predictor variables. A *P*-value less than 0.05 was considered statistically significant.

Results

A total of 400 participants were included in this study. Table 1 summarizes the demographic characteristics of participants. Respondent's knowledge, attitude and practices related to sun exposure and socio-demographic predictors are shown in Tables 2 and 3.

Table 2 shows the results of univariate analysis. The result of the simultaneous effect of variables assessed by multivariable logistic regressions is presented in Table 3.

Table 1. Demographic characteristics of participants.

Variables	Frequency
Gender (%)	
Female	192 (48)
Male	208 (52)
Marital status (%)	
Single	137 (34.25)
Married	246 (61.5)
Divorced	8 (2)
Widowed	9 (2.25)
Education level (%)	
Less than diploma	54 (13.5)
Diploma	160 (40)
University	186 (46.5)
Age	
(Mean±SD)	34.7±12.12
≤20	34 (8.5)
21 – 35	194 (48.5)
36 – 50	123 (30.8)
51 – 65	43 (10.8)
≥66	6 (1.5)

Knowledge of protective behavior

According to questions about population knowledge, our findings showed that the majority of participants knew that they should protect their skin against sunlight (question 2: 90.8%); most were aware of the fact that the more one is exposed to sun the more probable is the harm (question 3: 89.5%) as well as the adverse effects of sun exposure (question 1: 87.2%). The majority of participants responded correctly that sun exposure is more harmful in children as compared to adults (question 4: 80.5%); moreover, they were well aware that men also need to be protected against sun exposure (question 6: 78.8%). The participants knew that tanning is a threat to skin (question 5: 68.8%).

Awareness of skin protection against sun rays and the adverse effect of the sun as well as sun exposure duration was significantly lower among older individuals (OR= 0.957, 0.967, and 0.970, respectively). Gender was significantly associated with questions three and five; in both cases women had better knowledge compared to men (OR=2.882 and 2.495, respectively). As for educational level, both high school graduates and university graduates were more knowledgeable compared to high school undergraduates regarding all questions except for question number four (OR=1.517 and 1.565 compared to high school undergraduates). After assessing the simultaneous effect of variables, the same results were obtained; nevertheless, in questions one and three, age was not contributing factor (Table 3).

Attitudes toward sun exposure

Regarding the questions about attitudes, the majority of respondents stated that using sunscreen is not an easy task (question 2: 58.8%). Although the majority of them believed skin cancer can effectively be prevented personally (question 5: 61.8%), only 9.5% of them thought cancer risk is very highly or highly probable (question 3). Most thought tanning makes their skin look more charming (question 1: 78.5%).

Compared to high school undergraduates, having high school or university degrees was significantly associated with the answer to the question on tanning (OR= 3.760 and 3.989, respectively). Moreover, university graduates have significantly better attitudes on question five (OR= 2.053) compared to high school undergraduates but not on question three (OR= 0.358). Positive attitude towards tanning was lower among those who were married or ever married compared to those who were single (OR= 0.514).

Practice of sun protective behavior

Most of the respondents stated that they sun bathed less than five times a year (question 2: 88.8%). The majority also had never tanned or tanned only once (question 3: 87.8%). Participants stated that they cover their skin as a protection against sun rays by wearing long-sleeve blouses or hats 41% of the time. The use of sunscreen cream was stated by only one third of the participants (question 5; Table 2).

Age was significantly associated with exposure to sun rays. Even though older people protect themselves better by wearing suitable clothing, they use less sunscreen creams. Those with university degree have significantly better practice towards using sunscreen creams compared to high school undergraduates (question 5, OR= 2.886). There were positive behaviors on daily exposure to the sun rays and covering up the body (questions 1 and 4) among married/ever married people than those who were single (OR= 2.244 and 1.610, respectively). According to Table 3, after adjustments were made for the remaining variables, age was removed from the model in question 1. Moreover, marital status was removed from the model in question 4, but those with university graduates had significantly better practice toward covering up the body than high school undergraduates (adjusted OR= 2.075).

Discussion

In the present study, academic education was significantly associated with knowledge about sunscreen. This result is in line with those by Cohen et al.[15] and Hajheidari et al.[16] Additionally, age was significantly correlated with knowledge so that the highest percentage of knowledge was observed in the age group of 21 – 35 years who had university degrees. Although some studies support our findings,[17] there are others that concluded differently.[18] The study by Robinson et al.[18] focused on a specific age group (high school teenagers); therefore, differed from the results of our current work.

However, marital status was not significantly associated with knowledge. This result was in line with the study conducted in Sari (a city in northern part of Iran).[16]

Compared to men, women had better knowledge towards the amount of sun exposure and towards tanning. This result

Table 2. Sunscreen knowledge, attitudes and practice in relation to socio-demographic predictors (results of univariate logistic regression).

	Percent	*n*	Socio-demographic predictors (OR and 95% CI)				
			Age	Gender	Educational Qualifications		Marital status
				(Female/ Male)	(High school graduate/high school under graduate)	(University/ high school under graduate)	(other/single)
Knowledge about sun light and use or sunscreens (% who answered completely agree, agree)							
Q1. Adverse effect	87.2	349	0.967 (0.945, 0.989)*	0.797 (0.442, 1.436)	4.55 (2.168, 9.154)*	11.20 (4.836, 25.939)*	1.054(0.570, 1.951)
Q2. Skin protection	90.8	363	0.957 (0.933, 0.983)*	1.396 (0.702, 2.777)	5.654 (2.538, 12.597)*	15.00 (5.569, 40.401)*	0.914(0.444, 1.881)
Q3. Sun exposure duration effect	89.5	358	0.970 (0.947, 0.995)*	2.882 (1.405, 5.911)*	5.686 (2.642, 12.239)*	15.042 (5.902, 38.337)*	1.205(0.623, 2.332)
Q4. Children skin protection	80.5	322	1.012 (0.991, 1.034)	1.028 (0.628, 1.688)	1.517 (0.733, 3.137)	1.565 (0.767, 3.193)	1.537(0.926, 2.550)
Q5.Tanning risk	68.8	275	0.995 (0.978, 1.013)	2.495 (1.603, 3.884)*	3.826 (1.999, 7.322)*	7.175 (3.699, 13.917)*	1.119(0.719, 1.742)
Q6. Male skin protection	78.8	315	0.982 (0.963, 1.001)	0.931 (0.576, 1.503)	2.285 (1.187, 4.402)*	4.231 (2.137, 8.376)*	0.868(0.520, 1.448)
Attitude towards sun exposure (% who stated that)							
Q1.Tanning (not at all/a little charming)	21.5	86	0.973 (0.952, 0.994)*	0.984 (0.610, 1.586)	3.760 (1.273, 11.102)*	3.989 (1.365, 11.657)*	0.514(0.316, 0.836)*
Q2. Sunscreen usage (very easy, easy)	41.2	165	1.004 (0.987, 1.020)	0.712 (0.477, 1.062)	0.619 (0.333, 1.151)	0.600 (0.326, 1.104)	0.978(0.643, 1.487)
Q3. Cancer risk perception (very highly/highly probable)	9.5	38	0.986 (0.957, 1.015)	0.682 (0.345, 1.349)	0.422 (0.175, 1.016)	0.358 (0.149, 0.860)*	1.002(0.495, 2.027)
Q4. Cancer concern (very highly/ highly)	15.2	61	0.989 (0.966, 1.013)	0.715 (0.411, 1.243)	1.143 (0.521, 2.510)	0.471 (0.203, 1.093)	0.910(0.515, 1.608)
Q5. Cancer prevention (very highly/highly)	61.8	247	1.000 (0.984, 1.017)	1.496 (0.996, 2.247)	1.748 (0.938, 3.255)	2. 053 (1.111, 3.792)*	1.492(0.972, 2.274)
Practice (% who reported doing that)							
Q1. Sun exposure duration (less than an hour a day)	48	192	1.024 (1.007, 1.041)*	1.077 (0.727, 1.594)	1.347 (0.725, 2.504)	1.052 (0.572, 1.935)	2.244(1.464, 3.438)*
Q2. Sun bathing (never, <5 times)	88.8	355	1.002 (0.976, 1.028)	0.961 (0.517, 1.787)	2.370 (0.984, 5.707)	1.786 (0.784, 4.067)	1.189(0.926, 2.258)
Q3. Tanning history (never, once)	87.8	351	1.002 (0.977, 1.027)	0.598 (0.326, 1.097)	1.175 (0.462, 2.988)	1.005 (0.408, 2.479)	1.379(0.748, 2.542)
Q4. Protective clothing (always, often)	41.0	164	1.021 (1.004, 1.038)*	1.410 (0.945, 2.103)	0.965 (0.505, 1.842)	1.727 (0.921, 3.237)	1.610(1.047, 2.474)*
Q5. Sunscreen usage (always, often)	31.8	127	0.978 (0.960, 0.996)*	1.151 (0.755, 1.754)	1.176 (0.551, 2.508)	2.886 (1.400, 5.949)*	0.652(0.421, 1.002)
*Significant							

was also similar to those of Filiz et al.,[17] Alberg et al.,[19] and Hajheidari et al.[16] These studies all showed that women were more knowledgeable in this regard.

On the other hand, attitude in general did not show significant association with gender, age, marital status, and education. Although these findings were similar to the study conducted in Turkey,[17] it differed from those by Mermelstein et al. and Hills et al.[20,21] The difference basically lay in the different approach towards study design. In this study, each questionnaire was completed after careful observation by the interviewer rather than the participant.

Compared to studies conducted in the U.S.[7] and Australia[5], our studied population was less worried about skin cancer. Only 15% were concerned about skin cancer and 40% declared that they did not worry at all. This may lie in their positive attitude towards sunlight. The studies of the US[7] and Australia[5] showed that the more people were at risk of sunlight, the more conservative behavior they manifested. In our study, however, due to insufficient knowledge about skin cancer and the ways one can be affected, people do not sense its danger and do not protect themselves despite the high risk in Tehran.

According to practice, women were more concerned about using sun protection creams than men. Argyriadou et al.,[6] Filiz et al.,[17] Miles et al.,[22] and others [19,23,24] reached the same conclusion.

Moreover, our study showed that university graduates had significantly better behavior. The same conclusion was achieved by Arthey et al.,[25] Filiz et al.,[17] and Miles et al.[22] We did not find a significant relation between practice and age. Furthermore, marital status was not significantly associated with practice except for sun exposure duration. These

Table 3. Sunscreen knowledge, attitudes and practice in relation to socio-demographic predictors (result of multivariable logistic regression).

	Socio-demographic predictors (adjusted OR and 95% CI)				
	Age	Gender (Female/Male)	Educational qualifications (High school graduate/high school under graduate)	Educational qualifications (University/high school under graduate)	Marital status (other/single)
Knowledge about sun light and use or sunscreens (% who answered completely agree, agree)					
Q1. Adverse effect	**NS**	**NS**	4.455 (2.168, 9.154)	11.20 (4.836, 25.939)	**NS**
Q2. Skin protection	0.970 (0.944, 0.997)	**NS**	4.938 (2.178, 11.193)	12.646 (4.619, 34.625)	**NS**
Q3. Sun exposure duration effect	**NS**	2.700 (1.251, 5.826)	6.276 (2.855, 13.798)	13.954 (5.413, 35.973)	**NS**
Q4. Children skin protection	**NS**	**NS**	**NS**	**NS**	**NS**
Q5. Tanning risk	**NS**	2.377 (1.485, 3.804)	4.218 (2.163, 8.226)	6.798 (3.458, 13.361)	**NS**
Q6. Male skin protection	**NS**	**NS**	2.285 (1.187, 4.402)	4.231 (2.137, 8.376)	**NS**
Attitude towards sun exposure (% who stated that)					
Q1. Tanning(not at all/a little charming)	**NS**	**NS**	4.036 (1.357, 12.006)	3.953 (1.346, 11.611)	0.503 (0.306, 0.826)
Q2. Sunscreen usage (very easy, easy)	**NS**	**NS**	**NS**	**NS**	**NS**
Q3. Cancer risk perception (very highly/highly probable)	**NS**	**NS**	0.422 (0.175, 1.016)	0.358 (0.149, 0.860)	**NS**
Q4. Cancer concern (very highly/highly)	**NS**	**NS**	**NS**	**NS**	**NS**
Q5. Cancer prevention (very highly/highly)	**NS**	**NS**	**NS**	2. 053 (1.111, 3.792)	**NS**
Practice (% who reported doing that)					
Q1. Sun exposure duration (less than an hour a day)	**NS**	**NS**	**NS**	**NS**	2.244 (1.464, 3.438)
Q2. Sun bathing (never, <5 times)	**NS**	**NS**	**NS**	**NS**	**NS**
Q3. Tanning history (never, once)	**NS**	**NS**	**NS**	**NS**	**NS**
Q4. Protective clothing (always, often)	1.025 (1.008, 1.043)	**NS**	1.105 (0.569, 2.144)	2.075 (1.081, 3.984)	**NS**
Q5. Sunscreen usage (always, often)	0.981 (0.963, 1.000)	**NS**	1.075 (0.500, 2.312)	2.591 (1.245, 5.391)	**NS**
NS= not significant					

were supported by the findings of Miles et al.[22] but not by Arthey et al.[25] A possible justification for this finding could be the high socio-economic status of the population under study, causing them to take good care of themselves against harmful sun exposure irrespective of age. However, there has been a notable incline towards high-risk actions such as sun bathing and tanning. This is especially due to numerous advertisements that publicize bronze skin as a sign of beauty. A similar behavior has been seen in studies conducted in Greece[6] and Belgium[12]; nevertheless, they have also reported a considerable percentage of sun protector use. In our study, however, there is a huge gap between correct attitude and practice with respect to sunlight.

Our population, selected suitable sun protection lotions/creams mainly through consulting a physician or a health specialist (about 54.5%); whereas, in the studies by Argyriadou et al.[6] and Weinstein et al.[26] media was the basic source of motivation. Even though all sorts of cosmetics and sun protection products are available in most drug stores, they are not commonly advertised through Iranian media.

As a result, people are mostly advised by their physician, health specialist, and in some cases by pharmacists.

Like studies in Turkey[17] and the US,[27] the majority of the studied sample used undesirable sun protection creams with an SPF of 15 or less. High SPF cream would cause a slight change in skin color, which makes it less popular; moreover, people most often decide on using sun protection creams without consulting their physicians to choose the correct SPF. The percentage of sun protection creams, which was reported in our study, was higher compared to the study conducted in Sari,[20] a city in northern Iran. This mainly goes back to a higher socio-cultural archetype of the population under study.

It is worth mentioning that people protected themselves against sun more by covering parts of the body that are exposed to sun rather than by using sunscreen creams as major protection technique in our study. This indicates that people are not well aware of protecting themselves by using sunscreen creams. Moreover, the majority of them do not wear suitable outfits to protect themselves. In our Islamic society, where women are obliged to wear a scarf, the issue is less sensitive; however, to educate men in this regard is an indispensable concern.

Based on what has been concluded so far, most of our findings are in line with studies conducted inside Iran as well as those conducted in other countries, emphasizing educating people about the importance of undesirable and harmful side effects of sun burn and about the ways it can be safely protected. It has also been concluded that both men and women need to be encouraged to use correct methods of sun protection such as using sunscreen creams with a suitable SPF. Like retrospective studies, ours was not completely safe from the undesirable effects of possible confounders.

Our study was confined to one area of Tehran; thereby, the results cannot be generalized to the whole city; however, we would expect similar areas to have the same results. It is, therefore, highly recommended to perform the same study in other areas, especially those with a lower socio-economic level as we expect the situation would be worse there.

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