ORIGINAL REPORT

Skin Protective Behavior Amongst Girl Students; Based on Health Belief Model

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Abstract- Skin cancer is the most prevalent type of cancer in most of the countries and more than 90% of cancer cases are related to ultra violet rays of the sun. Therefore protective behaviors against sunlight are considered the most essential measures for skin cancer prevention. This study has been conducted to determine the frequency of protective behavior against sunlight among female students of Tehran city high schools. The Health Belief Model has been used for this cross-sectional study to analyze the factors related to protective behaviors. A multi-phase sampling method was used. 941 female student of Tehran city high schools were studied using a probed question form. The data were then analyzed using SPSS software. During the study of protective behaviors against the sunlight, 24.7% of participants mentioned that they always use sunscreen. The behavior of using sunscreen is related to perceived sensitivity, severity and benefit amongst the students (P<0.05). Also 3.8% of the students who participated in our study were always using gloves in summer to protect against sunlight. The behavior of using gloves in summer was also related to perceived sensitivity, severity and benefit (P<0.05). Physicians were the most effective influencing people with 84.9% influence on the appropriate decision making by these students. There is a low frequency of protective behavior against sunlight among the female students of Tehran city high schools. These findings show the necessity of training the students in this regard and promote the protective behaviors amongst them.

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Keywords: Health Belief Model; Protective behaviors; Sunlight

Introduction

Malignant diseases are considered to be among the main reasons of death in developed societies and would be on increasing trend all over the world and particularly in developing countries (1). Skin cancer is one of the most prevalent types of human cancers which according to studies, 1.3 million new cases of it occur each year in United States (2).

Skin cancer prevalence has been increasing in recent decades; and this increase can be ascribed to atmosphere changes including the change in ozone layer thickness along with changes in personal and social habits since most of the cancer cases are due to frequent exposure to sunlight (3). The most important risk factor for this type of cancer is exposure to sunlight and ultra violet (UV) rays (4) and protective agents against sunlight are considered as the most important preventive measures for skin cancer. Protection against the sunlight is more important in the regions more exposed to the sunlight due to geographical conditions but not limited to these regions. These facts have caused the protective behavior promoting programs to be implemented at national level not only in the countries like Australia, New Zealand, and Japan which have a lot of sunshine but in many other countries as well (5).

Studies have shown that different methods of avoiding exposure to sunlight such as using sunscreens, appropriate clothes like ling sleeve shirts, gloves and hat, sunglasses, walking in the shade and reducing the exposure time in high sunshine hours can be appropriate factors to reduce the symptoms of sunlight (6,7).

Many programs are designed in the countries to protect against sunlight; which the most of them include promoting social knowledge level regarding the relationship between skin cancer and sunlight exposure; and also preventive and protective behavioral trainings (8).

The highest success rate for health promoting programs can be achieved when the factors which

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somehow affect the human behaviors are considered in the program in addition to recognition of existing behavioral conditions in the society. Among the different behavioral study models, the Health Belief Model (HBM) has contributed largely to analyze social health behaviors through identifying personal perceived severity of not following healthy behaviors, personal perceived sensitivity of level of aptitude in getting involved in diseases and their symptoms, and also identifying perceived benefit of following healthy behaviors from patient's perspective along with the obstacles preventing from behavior implementation (9,10).

The studies have shown that the highest performances for the protective programs against the sunlight to prevent skin cancer are achieved at childhood and teenage levels (11-14). Even some studies have reported the sunlight protection to be effective only in childhood and teenage levels (15).

Therefore the students would be the target group if intervening measures are to be considered. We studied the protective behaviors of female high school students of Tehran city against the sunlight; since today's girls are tomorrow's mothers and they are usually the most impressive characters on children's behaviors.

Materials and Methods

This study is of the type of cross-sectional which took place as a descriptive analytical effort to examine the frequency of protective behaviors amongst female high school students of Tehran city on 2009-2010. The study population was female students of Tehran city high schools. First, six of Tehran city districts were chosen by a simple random method, and then three schools were chosen according to district authorities' selection. Sixty students of each school were chosen on the simple random basis to participate in the study. Totally 941 students were taken under evaluation.

The data were collected by means of a probed question form including 44 questions which fulfilled different aspects of the study. The questions were designed into several scopes including demographic information, perceived sensitivity (to which extent the person assumes herself to be exposed to danger), perceived severity (understanding the problem) perceived benefit (how practicing appropriate behavior would result in benefits) and obstacles preventing these behaviors and the questions related to program's goals as well. To calculate the score of each scope, each correct answer was evaluated as 3 points, each "I don't know" evaluated as one point, and zero points were assigned to incorrect answers. The correct answer percentage was then calculated for each scope.

The question forms were completed using questioning method and were evaluated by experts as well. A pretest was conducted in one of the female high schools of Tehran city and the questions with low variance were improved or omitted. Final ration of question from obtained using "test retest" method was 0.73 after all. Protective behavior frequency was stated as percentage. The t-test method or Chi-square method and other related methods were used for determine the relationship between independent variables and dependent ones (according to the variable nature). The data were analyzed using SPSS (version: 11.5) software. The institute ethics committee approved this study.

Results

Among 941 participating students, 27.5% studied at first high school year, 28.8% at second year and 43.7% were studying at third high school year. 644 of the students (68.4%) had fair skin color and the rest had dark skin. Some questions regarding sunscreen creams were asked which table 1 shows their results.

Regarding the study of protective behaviors against sunlight, highest frequency for students' behavior was about walking in the shade, and lowest frequency was about using gloves as 74.6% of them stated that they walk in the shade or covered places when there is sunlight and 8.7% of them said there is no facilities for them to walk in the shade or covered places. Also among those students, only 3.8% always and 12.6% sometimes used gloves in summer to protect their hands against sunlight. Table 2 shows the frequencies of different behaviors of students.

The results showed the level of perception among participants regarding sensitivity and aptitude for getting involved with disorders caused by sunlight exposure or perceived sensitivity to be at score of 7.2±3.2 which is equal to 48 percent. The perceived severity or participants' level of perception regarding intensity of symptoms caused by long time exposure to sunlight was at score of 17.1±3.5 which equivalents to 57% and finally the perceived benefit or level of perception regarding benefits and gains of practicing protective behaviors against sunlight was at the score of 10.95±3.5 which is equivalent to 52.1 percent.

Table 1. Questions about sunscreen.

Questions about Sunscreen	Choices	Relative frequency	Absolute frequency
Using sunscreen with what degree of SPF is appropriate?	15	30	3.2
	20	29	3.1
	25	72	7.7
	30	230	24.4
	30< SPF < 50	150	15.9
	>50	83	8.8
	I don't know	347	36.4
Which choice is correct about sunscreen creams?	It's better to renew each 2 hours	209	22.2
	It's better to renew each 5 hours	156	16.6
	No need to renew	205	21.8
	I don't know	371	39.4
What is the timing for using sunscreen creams?	10 minutes after exiting home	158	16.8
	Right before exiting home	249	26.5
	Half an hour before exiting home	288	30.6
	I don't know	246	26.1
How much sunscreen cream should be applied each time?	Less than a knuckle	184	19.6
	One knuckle	192	20.4
	More than a knuckle	74	7.9
	No specific amount	491	52.2

Table 3 shows the relationship between perceived sensitivity, perceived severity, and perceived benefit separately for implementing each behavior. There is a significant relationship between using sunscreen creams and perceived sensitivity, perceived severity and perceived benefit among students (P<0.01). The behavior of using gloves in summer time has a significant relationship with perceived sensitivity, severity and benefit (P<0.05). Also there is a significant relationship between using sunglasses and perceived sensitivity and severity (P<0.05). The behavior of not going out of home in high sunshine hours did show a significant relationship with perceived severity (P<0.05); and behavior of walking in shade or covered places had a significant relationship with perceived sensitivity and severity as well. No significant relationship could be found between using cap or veil and any perceived factor.

As it is shown, the participants who practice any of these behaviors would have higher points only if there is a significant difference.

Table 2. Frequency of protective behaviors against sunlight amongst Tehran city high school girls.

Protective behavior against sunlight		Absolute frequency	Relative frequency
Using sunscreen cream	Yes	232	24.7
	No	263	27.9
	Some times	446	47.4
Using Gloves	Yes	36	12.6
	No	786	83.5
	Sometimes	119	12.6
Using sunglasses	Yes	303	32.2
	No	294	31.2
	Sometimes	344	36.6
Using cap or veil	Yes	97	10.3
	No	569	60.5
	Sometimes	275	29.2
Not going out at high sunlight hours	Yes	340	36.1
	No	443	47.1
	Not possible	158	16.8
Walking in shade or covered places	Yes	702	74.6
	No	157	16.7
	Not possible	82	8.7

Table 3. Relationship of perceived sensitivity, severity and benefit with protective behaviors against sunlight.

Protective behavior against sunlight		Practicing	Not practicing	*P*-value
Using sunscreen cream	Perceived sensitivity	8.32±2.32	7.79±3.17	* <0.01
	Perceived severity	17.74±4.17	16.97±4.52	* <0.01
	Perceived benefit	11.39±3.86	10.8±3.36	* <0.01
Using gloves	Perceived sensitivity	6.77±3.2	7.96±3.19	* <0.05
	Perceived severity	15.58±5.38	17.22±4.4	* <0.05
	Perceived benefit	9.58±3.31	11.00±3.50	* <0.05
Using cap or veil	Perceived sensitivity	8.40±3.25	7.87±3.20	> 0.05
	Perceived severity	17.63±4.31	17.11±4.46	> 0.05
	Perceived benefit	10.73±3.34	10.97±3.52	> 0.05
Not going out in high sunshine hours	Perceived sensitivity	8.09±3.35	7.83±3.19	>0.05
	Perceived severity	17.57±4.75	16.93±4.25	*< 0.01
	Perceived benefit	11.01±3.54	10.91±3.48	> 0.05
Walking in shade or covered places	Perceived sensitivity	8.07±3.24	7.49±3.12	*<0.01
	Perceived severity	17.48±4.37	16.22±4.56	*<0.001
	Perceived benefit	10.97±3.48	10.89±3.55	>0.05
Using sunglasses	Perceived sensitivity	8.28±3.22	7.76±3.20	*<0.01
	Perceived severity	17.72±5.10	16.90±40	*<0.001
	Perceived benefit	11.16±3.36	10.80±3.56	>0.05

* Statistically significant

Table 4. Frequency distribution of person or resources whose advices were followed.

Trusted Person or resource	Number	Percent *
Physicians	220	84.9
Healthcare personnel	111	42.6
Radio & TV	123	47.4
Parents	41	15.8
Spouse	38	14.4
Newspapers & magazines	45	17.5
Brothers & sisters	20	7.9
Co-workers	10	3.8
Neighborhood trustworthy	8	3.1

* Participants could specify more than one item

Also the students stated the change in skin color (44%) and school regulations (38%) as the obstacles for using sunscreen creams; and lack of knowledge about benefits (49%) and cultural and religious beliefs (29%) as obstacles for using gloves; also they stated that lack of knowledge about benefits (40%) and school regulations (36%) and cultural and religious beliefs (30%) are the obstacles for using cap or veils.

Table 4 shows the people or resources whom the students used to follow their advice. As can be observed, the physicians have the highest rate of 84.9 percent.

There was a significant relationship between using sunscreen creams and physician, parents and acquaintance advice (P<0.01); and using gloves had only a significant relationship with acquaintance advice (P<0.01). The advice of no person or resource could cause significant differences for practicing specific behaviors.

Discussion

Very sparse studies regarding examining protective behavior against sunlight based on HBM have been done so far. This fact makes it difficult to compare the results with other studies. Our study has shown walking in shade and covered places to be the most prevalent protective behavior against the sunshine among other behaviors. It seems that not requiring any tools and facilities for practicing this behavior is the reason of its prevalence. On the other hand, it seems that practicing this behavior is not only a result of knowledge. Most people walk in the shade because of heat, eye irritation under direct sunlight etc. Devos *et al.* reported walking in the shade as the most prevalent protective method against sunlight as well (16).

Our study has shown that 24.7% of students always use sunscreen creams and 47.4% sometimes use them as a protective behavior against sunlight which is the second rank protective method according to frequencies. Perhaps ease of use, superficial aspects, not impeding daily activities and sun block products advertisements cause this behavior to be more prevalent than other

protective behaviors which require using facilities (such as cap, veil, sunglasses, gloves etc).

Dalli *et al*. reported 59% prevalence for sunscreen creams (17). Usage rate for sunscreen creams were 47% in summer and 3% in winter amongst the students according to 2. Benvenuto-Andrade *et al*. study (2). Livingaston *et al*. showed that 35% of women and 8% of men used sunscreen creams regularly and two third of all population used them on irregular basis (4). Jonse *et al.* results showed that less than 20% of the population used sunscreen creams regularly (18). Molgó *et al.* study reported that 70% of the population used sunscreen creams (19). Aqullina *et al.* reported 46% using sunscreen creams (20).

Considering the studies which has been done so far, the level of using sunscreen in most of the places of the world, seems to be equal to or lower than our study. Although the words "always" or "sometimes" were not mentioned in above studies, so we cannot compare exactly. Maybe our inclusion of sometimes usage in this calculation has helped the results to be as this high. Most of the students were using sunscreens with SPF 30. 74% of the population in Molgó *et al*. study used SPF>15 (19). Aqullina *et al*. study has shown that among those 46 percent who were using sunscreen creams, 17% used SPF<16, 54% used SPF=15-30, and 20% used SPF>30 (20).

Using sunscreens with different SPF factors reported in different studies maybe can be justified by the people using sunscreen according to doctors' advice who prescribe different levels of SPF to them according to type of their skin and other conditions. Although it seems peoples knowledge about SPF factor is not enough or scientifically valid. In our study, only 22.8% of students acknowledged the right timing to apply the sunscreen cream to be in 2 hours intervals and 39.4% of them did not know about it.

Altogether, it seems that the level of knowledge regarding correct use of sunscreen creams (application timing, renewing time and usage amount) is low and perhaps this fact is a result of inappropriate training in this regard.

78.3% of participants in the study believed that long term exposure to sunlight increases the possibility of skin sunburn. Also 41% of the students stated that their skin gets red quickly when exposed to sunlight and it's highly prone to sunburn.

60 percent of students reported previous sunburn records in Su study (21). Perhaps the reason of lower level of sunburn in our study (despite hot and dry weather conditions in our country) is the type of religious costumes which women use and protects them from sunburn to a high extent. There was a significant relationship between perceived intensity, benefit and sensitivity with using sunscreen creams. Those who perceived the symptoms of exposure to sunlight and know the importance of protection against sunlight, and also know the benefits of protective behaviors, would practice these protective behaviors such as using sunscreen creams more than the others. So if there are some interventions to be made in this regard, they must include all the aspects of sensitivity, intensity, and benefit.

There was a significant relationship between physicians' advice regarding sunscreen creams usage and the personal behavior of actually using them, shown in our study.

It seems that physicians play an important role in social training and promoting healthy behaviors including protection against sunlight. Therefore it's necessary to train the physicians more and encourage them to talk more about this issue to their patients. The level of using cap and veil seems to be low among the female students of Tehran city, and this fact shows low knowledge level between them regarding necessity of using such physical obstacles. The necessary trainings in this regard should be given, and revising school regulations, trainings about these methods and promoting them are among the necessities as well.

Also as mentioned before, there was no relationship between using caps and any of perceived sensitivity, intensity or benefit items, which perhaps could be justified by the fact that existing obstacles such as cultural and religious beliefs are so strong that prevent students from practicing those behaviors; even if peoples perceived intensity of the disease and possibility of getting involved is high, or there are benefits for them in practicing them.

Aquilina *et al*. study showed that 43% of women and 33% of men were using a hat (20). Dalli *et al*. study reported 55.1% of the high school students were using caps (17). Scerri *et al*. reported the levels of using ridge hats to be 32% for leisure time activities and 37% for open space working (22). Robinson *et al*. showed that 32% of population has been using a cap (23).

As could be observed, the usage percentage of cap in this study has been higher than ours. One of the reasons for that can be lower knowledge of our students in this regard which shows the necessity of more training for them. Also there are more cultural and religious obstacles for using cap in our country. Dallid study has shown that 36.7% of the students use sunglasses (17).

Also Cokkinides *et al.* study has shown that 32% of young people use sunglasses. The usage percent in these studies are almost equal to our study results (24). 50% of the people use sunglasses according to Molgó *et al*. study (19). Nikolaou *et al*. reported the most prevalent protective behavior to be using sunglasses with 83.4% of people which of them 88.7% were female (25).

Perhaps variation between the results can be justified by the fact that those studies have been done outside Iran were there are fewer cultural obstacles against the behavior of using sunglasses and also they examined people with higher ages. People in higher ages possibly have more knowledge regarding sunlight symptoms.

Lack of knowledge about necessity of using gloves (in summer time), cultural beliefs, and considering the gloves to be inefficient have been shown to be the most prevalent obstacles for using gloves by students.

As observed before, the level of using gloves as a behavior amongst students to protect against sunlight is low for which the most possible reason is low level of students' knowledge about necessity of using gloves in summer time. The other obstacle stated by students was cultural and religious beliefs. Cultural belief about this issue mainly is that using gloves is special to winters and using them in summer time is not normal.

Also our study has shown that there is a relationship between perceived intensity and limiting the time spent out of home by the students. That means as the person gains higher perception about intensity of symptoms when going out at high sunshine hours; the time spent out of home in these hours tends to get more limited. According to Aquilina *et al*., 42% of people reported less than once per week, 38% of them reported 2-3 times weekly and 19% reported more than 3 times per week of exposure to sunshine and most of the exposure has been reported by people between 16 and 25 years old (20) . Molgó *et al.* reported that 37% of the population has been exposed to sunshine in high risk hours for more than 2 times per week (19).

In our study, most of the students stated that they follow doctors' advices regarding healthcare issues. Benvenuto-Andrade *et al*. reported the main information resource for most of the students to be mass media (2). According to Halpern *et al.* 66% of population stated that they receive their knowledge from media (26). Information resource for 57% of participants in Molgó *et al*. study was TV (19). Since the physicians play an important role in students' behaviors, it seems that school doctors could have an important role in improving healthcare and well being level of the society. In conclusion, the frequency of protective behaviors against the sunlight is low amongst students, and improving their knowledge level and revising school regulations, along with promoting appropriate behaviors by school healthcare advisor can be effective on practicing appropriate behaviors by students.

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