Awareness to sun exposure and use of sunscreen by the general population

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Abstract

Sun exposure has a pathogenic effect on the development of skin cancer, whose prevalence increases worldwide. Educational programs are carried out to change high risk sun exposure behaviours. The aim of this study was to evaluate the knowledge of Saudi population regarding sun exposure and the risk of skin cancers, as well as to study their sun-protective attitudes and practices. A cross-sectional population-based survey using specially devised questionnaire on a stratified random sample of general population in Qassim Province between January and March 2010. One thousand three hundred and seventy six persons participated in the study. A high sun exposure of more than 10 hours per week was reported by 661 persons (48%). Fifty six percent of respondents were aware of the association between sun exposure and skin cancer but the rate of sun screen use was only 8.3%. Socio-demographic factors more likely to be associated with sunscreen use were: females, higher social class, higher levels of education, type 4 skin and married individuals. This study has indicated a low rate of sunscreen use by our population despite reasonably good knowledge about the hazards of sun exposure. This necessitates the need for health education program. We hope that the results of our study will be used for setting up a sun policy for Saudi general public.

KEY WORDS: sun exposure, sunscreen, knowledge

Introduction

Ultraviolet radiation from sunlight exposure is a modifiable environmental hazard that is believed to be the main determinant of skin cancer. It is linked to the development of most skin cancers, especially basal cell carcinomas, squamous cell carcinomas, and some types of melanoma. It is also associated with other forms of skin damage, including sunburn and photoaging [1]. Skin cancer has increased steadily during the past four decades, and it accounts for 1 in 3 cancer cases worldwide [2]. A significant amount of a person's total sun exposure occurs during childhood and adolescence [3]. Studies have linked this exposure during early life to increased incidence of both melanoma and nonmelanoma skin cancer in later life [4]. Childhood and adolescence have been identified as key periods in the etiology of melanoma in adulthood [5]. In adolescence, target cells are still immature and the skin is thinner and more sensitive [6, 7]. Individual risk of skin cancer is also strongly related to skin types, the risk being higher among people who burn easily and tan poorly [8, 9].Avoidance of sun exposure is considered to be an effective and safe tool for prevention against skin cancer and photoaging [10-12]. Sunscreens inhibit the transmission of ultraviolet (UV) radiation into the skin by reflecting, absorbing, or scattering such radiation. Consequently, sunscreens have been recommended as a form of protection against sunlight, with protection increasing with higher sun protection factor [13]. Several factors have been reported in the literatures that are positively associated with the use of sunscreens. The most important factor is the female gender followed by higher income, greater schooling, and persons with light skin colour [14, 15]. During the past years, patient education efforts have increased public awareness of the harmful effects of excessive sun exposure as well as the benefits of using sunscreen [16-18]. Public education campaigns may have resulted in an increased awareness of the risks of skin cancer, but their effect on sun protection behaviour is less encouraging [19]. Measurements against sunlight exposure and sunscreen use are becoming relevant to public health. In Saudi Arabia, there are yet no population-based studies measuring the prevalence of sunscreen use. The objectives of this study were to evaluate the knowledge of Saudi population regarding sun exposure and the risk of skin cancers, as well as to study their sun-protective attitudes and practices.

Materials and Methods

Between January and March 2010, a cross-sectional population-based study was undertaken in Qassim Province. The

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province is located in the centre of Saudi Arabia and inhabits about one million population. The capital city of Qassim province is Buraydah, which is inhabited by approximately 49% of the region's total population. To estimate the prevalence of sun protection behaviours of 35% with a sample error of ± 3%, at least 1040 individuals needed to be interviewed. Sample size calculations used the following parameters: 95% confidence level, and an additional 10% to cover refusals. The sample was selected following a stratified sampling procedure. A random sample of hospital and primary health care facilities was drawn to represent health care settings from the main cities of the province. The numbers of health care facilities selected from each city were proportional to the size of the population in each city. Questionnaires were distributed to hospitals and primary health care outpatients and members of the general public passing through the clinics for any reason were approached and invited to participate. Data were collected by the physicians, nurses and medical students receiving training at the selected health care facilities. They received an orientation about the purpose and methodology of the survey before the start of the study. The voluntary participation and anonymous reporting were ensured to all participants. Each questionnaire included a detachable cover sheet that explained the voluntary and anonymous nature of the survey and indicated that completion of the survey implied informed consent. This study was approved by the Research and ethical committee of Qassim College of Medicine. A questionnaire was designed to measure the awareness of hazards of exposure to sun, knowledge and use of sun protection behaviours, and the use of sunscreen preparations. All questions were developed by the author after carrying out a literature search for sun awareness surveys in other countries. All data were collected using a standardized, pre-coded, and pretested questionnaire with questioning of a closed nature. The questionnaire was administered to 10% of the sample in a pilot study to test the clarity, item relevance, feasibility and quality control. Changes were incorporated into the final questionnaire. The questionnaire included 3 sections. The first section included 10 questions that focused on characteristics of study subject such as sex, age, marital status, education, family income per month (used as socioeconomic indicator), home place whether urban or rural, indoor or outdoor occupation, self-reported skin type (whether or not skin burns after prolonged exposure to intense sunlight), family history of skin cancer, and the weekly duration of exposure to sun. The second section of the survey included 20 questions about awareness of participants to hazards of exposure to sun, frequency of exposure to sun, reaction of skin to sun exposure, types and frequency of use of sun protection methods such as clothes and covers, and finally the knowledge of participants about nature and types of sunscreen preparations. The third section included 8 questions devoted basically to the users of sunscreen preparations and inquired about the reason for use, type of sunscreen preparation, frequency and place of application of the sunscreen preparations.

Statistical analysis

Data were entered and analyzed using statistical package of social science software (SPSS 11) with check for consistency, and p-values less than 0.05 were considered as significant. Basic descriptive analyses (frequency, percentage and mean) were performed for all independent variables and personal characteristics of the participants. Differences in sun exposure and sun protection behaviour among different personal characteristics were examined by using chi-squared test or Fisher's exact test. Differences between and among the means for quantitative data of the variables were examined by using the t test. Logistic regression was used to examine the independent predictive effects of demographic variables on use of sunscreen.

Results

A total of 1376 individuals were located and agreed to participate in the study (response rate, 94.5%) The background characteristics of the study population are shown in Table 1. The participants were diverse in terms of age; the mean age of participants was 35.9 years (age range, 18-59 years, SD, 14.9). There was almost an equal gender split, 709 were men (51.5%). Almost two thirds of participants were married 916 (66.6%). Individuals of high social class formed the majority of the study participants (79.9%). All participants were from urban areas. The majority of participants (881,

TABLE 1. Personal and demographic characteristics of the study population.

Characteristics	N=1376 (%)
Males	709 (51.5)
Females	667 (48.5)
Age, Mean (SD), Years	35.9 (14.9)
Marital Status	
Single	460 (33.4)
Married	916 (66.6)
Education	
Postgraduate	372 (27)
Graduate	390 (28.3)
Below secondary School	614 (44.6)
Socioeconomic Status	
High	1099 (79.9)
Low	277 (20.1)
Skin type	
II	282 (20.5)
III	881 (64)
IV	213 (15.5)
Occupation	
Indoor	839 (61)
Outdoor	537 (39)
Family history of Skin Cancer	73 (5.3)

TABLE 2. Sun Exposure and Sun Protection Behavior among Study Participants.

Factors	N=1376 (%)
Sun Exposure	
Weekly Sun Exposure	
5-10 h	715 (52)
>10 h	661 (48)
Stay in sun between 11am-3pm (adults)	749 (54.4)
Stay in sun between 11am-3pm (children)	1034 (75.1)
Practice of sun bathing in open air	364 (26.5)
Sun Burns	
History of sun burns	405 (29.4)
Frequency of past sun burns	
Once	276 (68)
> One	129 (32)
Knowledge of skin cancer	
Sunburns predispose to skin cancer	770 (56)
Sun protection behavior	
Take precautions to protect from sun	789 (57.3)
Wearing Head cover during daytime	
Rarely	461 (33.5)
Sometimes	129 (9.4)
Often	384 (27.9)
Always	402 (29.2)
Using tan improving preparation	12 (0.9)

TABLE 3. Use of sunscreen preparations among study participants.

Characteristics	N=1376 (%)
Use sunscreen preparations (N=1376)	114 (8.3%)
Frequency of use (N=114)	
Sometimes	49 (43%)
Often	65 (57%)
Preparation	
Cream	44 (38.5%)
Lotion	70 (61.5%)
Sun Protection Factor (SPF)	
> 30	82 (72 %)
< 30	32 (28%)
Time of application	
Morning	86 (75.5%)
Afternoon	28 (24.5%)
Site of application	
Face	49 (43%)
Hands	65 (57%)
Reason for use	
To avoid skin cancer	43 (38%)
To avoid skin darkening	71 (62%)
Reasons for non-use (N=1262)	
Do not have	686 (54.4%)
Not convenient	220 (17.4%)
Not Important	356 (28.2%)

64%) have skin type III. Participants had both indoor and outdoor occupations, 839 (61%) & 547 (39%), respectively. There was a low reported family history of skin cancer, 73 (5.3%). Table 2. depicts the experience of sun exposure, history and frequency of sunburns, knowledge of relationship between skin cancer and sunburns, and sun protection behaviour of the respondents. A high sun exposure of more than 10 hours per week was reported by 661 persons (48%). Almost half of respondents (749, 54.4%) reported that they stay in the sun between 11 am and 3 pm. The majority of participants (1034, 75.1%) demonstrated that their children stay in the sun during the same period. Sun bathing is not a common practice among study participants where only 26.5% of them reported it. When asked about history of suffering from sunburn, 405 individuals (29.4%) gave a positive history. More than half (770, 56%) of study participants demonstrated awareness of the relationship between sunburns and skin cancer and agreed to a question that asked whether sunburns could be responsible for skin cancer. Understandably, little more than half of study participants (789, 57.3%) confirmed that they take precautions to protect themselves from the sun which is almost similar to those who demonstrated awareness of the relationship between sunburns and skin tumours. Non-surprisingly, men demonstrated higher weekly duration of exposure to the sun than women ($p<0.001$). There is also a significant increase in the duration of weekly exposure to the sun with lower age groups where the maximum exposure was reported by the age group 18-24 years ($p<0.001$). Other demographic variables which show significantly higher duration of exposure to sun were being single, having below secondary school education, low social class, skin type 4, and outdoor occupation ($p<0.01$). History of skin cancer did not show significant difference. Higher levels of knowledge of relationship between sunburns and skin cancer were endorsed by those with higher education levels – graduates and postgraduates ($p<0.001$). Similarly, the females and the married persons showed significantly higher level of skin cancer knowledge ($p<0.01$). Other variables that demonstrated significant higher level of knowledge included individuals with skin type 2 & 3, having indoor occupation and those who reported a positive family history of skin cancer ($p<0.01$). However, there was no statistical difference in knowledge between participants based on their socioeconomic classes. Regarding sun protection behaviour; the women, the singles, the highly educated, indoor workers and those who had positive family history of skin cancer were significantly more prone to protect themselves from the hazards of sun exposure. On the other hand, persons of the low social class, and those with skin type 4 were less likely to take measures to protect themselves against sun. Only 114 persons (8.3% of study participants) reported use of sunscreen preparation. Table 3 illustrates frequency, formulations, reasons, site and time of application among the users. Most of sunscreen users prefer lotion preparations with sun protection factor greater than 30 and use the preparation mostly in the morning time. Most of users reported that they use sunscreen preparations to avoid hyperpigmentation. On the other hand, the majority of the study participants did not use sunscreen preparations (1262, 91.7%). The non-users explained that they do not use these preparations because they do not have them,

TABLE 4. Multiple logistic regressions on sunscreen use and socio-demographic characteristics.

	Odds ratio (95% C.I.)	*p* value
Females	2.14 (1.73 - 2.66)	0.001
Married	1.22 (1.03 -.44)	0.023
Postgraduate education	1.27 (1.06 - 1.53)	0.013
Higher social class	1.78 (1.60 - 1.87)	0.001
Skin type 4	1.98 (1.62 - 2.12)	0.001

or because the preparations are not convenient to use, or these preparations are not important (54.4%, 17.4%, 28.2%, respectively).The logistic regression on sunscreen use is summarized in Table 4. Females, participants from higher social backgrounds, those with higher levels of education, those with type 4 skin and those who are married were significantly more likely to use sunscreen. These associations were independent of other social and demographic characteristics.

Discussion

To our knowledge and after an extensive literature review, this is the first population-based study in Saudi Arabia to evaluate the prevalence of sunscreen use and to study the factors associated with sunscreen use among adults in an urban community in Saudi Arabia. Summer and autumn are the seasons with high UV index and people are more likely to engage in outdoor recreational activities. We selected the period between January and March because this period comes shortly after the autumn seasons and the recall period for sunlight exposure and sunscreen use was short. Non-surprisingly, the study showed that males, younger age groups, low social class, low educational level and skin type 4 are associated with significant increase in the duration of exposure to sun. These variables represent social, demographic and cultural milieu that promote exposure to sun and not taking the necessary protective measures against its hazards. These results are consistent with most studies that described the socio-demographics of sun exposures [7-9, 19-25]. Fifty six percent of our study participants demonstrated an awareness of the relationship between sunburns and the risk of skin cancer. This knowledge rate is low when compared with similar surveys carried out in western communities [23, 24]. The results of our study have emphasized the need for more health orientation and education programs. The present study showed that women were more likely than men to know about the hazards of sun exposure and were more likely to take protective measures including use of sunscreens. However, no gender difference was found in the use of clothes as protective methods. The finding that women use sunscreen more frequently than men has been reported by majority of studies on this subject [20-24]. This is likely related to the fact that women generally have more healthy lifestyles than men, and show greater concern towards the ageing of skin. Compared with women, men experience greater social pressure in terms of appearing independent, self-confident, strong, and brave, which frequently leads to the adoption of risk behaviours. The positive relationship found between sunscreen use and skin type 4 in our study is consistent with results of previous reports. The Sun Smart evaluation in Victoria, Australia, reported that 46% of people who almost always used sunscreen had been sunburned in the previous summer compared with only 31% of those who rarely used sunscreen [26]. Despite the relatively good knowledge among participants that exposure to sun and sunburns predispose to skin cancer, the rate of sunscreens use is low. Our data indicated that only 8.3% of the Saudi adult populations were using sunscreen regularly. Knowledge, although necessary, is frequently not enough for a change in attitude, and even less so for a sustained change in behaviour. To facilitate the transition from knowledge to a change in attitude and then on to a change in behaviour, behaviourally-based intervention strategies are needed. Childhood is an excellent time to form life-long prevention habits as attitudes and lifestyle patterns are still being formed and are most malleable during this period [27]. Public health interventions need to provide not only the knowledge but also promote the attitude change and preventive behaviour through consistent and repeated sun-education messages. Planning of education campaigns should consider how the message can support rather than compete with the dominant values and norms held by different population groups. Health education needs to begin early in school period, when students start making independent choices. Schools are ideal settings as they already have the infrastructure to help children acquire the necessary skills to establish healthy behaviours. Schools provide an opportunity to reach all children and young adults, and health education is already part of the curriculum. Acquiring sun-protection behaviours at school can affect behaviour away from school as well. However, contradictory goals may exist within schools. For example, as schools strive to increase physical fitness, there may be more outdoor activities and sun exposure. Despite the recognition of the importance of sun protection for school children, competing priorities may present barriers. Most of sunscreen users in our study reported that they use sunscreen preparations to avoid hyperpigmentation. These results agree with previous observations that knowledge of the community regarding sun risk and sun smart behaviours should be improved and endorsed. When asked about the reason for non-use of sunscreen applications, many participants reported that they "did not believe it to be important or convenient"; this gives the assumption that their outdoor activities entailed incidental rather than intentional sun exposure. The apparent misconception that no protection is required during frequent incidental exposures to the

sun may be a good reason for future primary prevention campaigns among highly exposed people to achieve better control of skin cancer. Respondents were required to determine their own skin type based on the brief description of each skin type included in the survey. Some participants might have misjudged their skin type despite this description. The low rate of sunscreen use in our study population might not be sufficient to pick the minor differences among our population variables. A study with larger sample size is recommended for this purpose. Future studies might also examine the different preparations for sun protection such as use of moisturizers containing sunscreen agents. Participants were asked about sun protection behaviours in the last summer and their response might have been affected by poor recall. Finally, the extrapolation of these results to other populations must be done with caution. Qassim province differs from other regions of Saudi Arabia in certain important aspects such as climate conditions, and socio-cultural background.

Conclusion

This study has indicated a low rate of sunscreen use by our population despite reasonably good knowledge about the hazards of sun exposure. This necessitates the need for health education program. We hope that the results of our study will be used for setting up a sun policy for Saudi general public.

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Declaration of interest

No conflicts of interest.

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