

AWARENESS TO HAZARDS OF SUN EXPOSURE AND USE OF SUNSCREEN AMONG GENERAL POPULATION IN MADINAH CITY, SAUDI ARABIA, 2017-2018: CROSS-SECTIONAL STUDY.

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ABSTRACT

Background: There is a consensus in the published literature upon the association between intense exposure to ultra-violet (UV) radiation and increased risk of skin cancer. The present study aims to investigate the awareness to hazards of sun exposure and use of sunscreen among the general population in Saudi Arabia. **Methods:** This was an observational survey-based cross-sectional study. We included adults' residents in Madinah city of the Kingdom of Saudi Arabia. Participants were invited to fill an online-based survey throughout December 2017. A 27-items questionnaire was used to measure the awareness to hazards of sun exposure and use of sunscreen. The analyses was

carried with SPSS software version 24. **Results:** We collected 611 responses, from which 97% were females. Half of the participants worked indoors without prolonged exposure to sun exposure, and almost 82% of the participants reported one or more skin problems. Sixty-seven percentage of the participants knew that sun exposure predisposition to skin cancer, but 38.9% already use sunscreen frequently. While 34% of the participants thought that sunscreen is not important. There were statistically significant relationships between the use of sunscreen and the presence of skin problems ($p=0.035$), sources of information ($p=0.002$), occupation ($p <0.001$), and the knowledge about the hazardous effect of sun exposure ($p <0.001$). **Conclusion:** In conclusion, a low number of Madinah population use sunscreen preparations. Awareness campaign and educational program is needed to increase Saudis awareness about the hazards of sun exposure and the beneficial effect of sunscreen use.

KEYWORDS: Sunscreen; Sun exposure; Occupational hazards; Cross-sectional study.

INTRODUCTION

Skin cancer, including melanoma and non-melanoma subtypes, is the most common type of cancer among white population.^[1] Recent epidemiological studies suggested a continuous increase of skin cancer incidence, with an incidence rates range from 5.3 to 50 cases per 100,000 persons in Europe.^[2] In addition, the annual mortality rate per 100,000 people from malignant skin melanoma in Middle East and North Africa has increased by 21.5% since 1990.^[3] In Saudi Arabia, skin cancer accounts for 3.2% of all newly diagnosed cancer cases in 2010 according to multiple reports, which ranks skin cancer as the ninth in both gender.^[4] Although this increasing trends, skin cancer can be a preventable malignancy by adhering to various protective measures.^[5]

There is a consensus in the published literature upon the association between intense exposure to ultra-violet (UV) radiation and increased risk of skin cancer.^[6, 7] According to Task Force on Community Preventive Services Recommendation, a number of preventable measures should be followed to prevent skin cancer, including sunscreen use.^[8] Application of sunscreen to the skin is widely used as an adjunct strategy, along with wearing protective clothing and seeking shade, to protect against skin cancer and photoaging that result from excessive sun exposure^[9]; a recent prospective randomized controlled trial^[10] of sunscreen use found a lower incidence of invasive melanoma among individuals assigned to a sunscreen intervention compared to those in the control condition.

Given the protective effect of regular sunscreen use, it is important to assess the knowledge about and attitude towards the use of sunscreen among the general population. A previous report by Wang *et al.*^[11] investigated the general sunscreen knowledge of the public and included 423 subjects; they reported that a major proportion of the included participants had a proper, but superficial, knowledge about sunscreen use. Another report^[12] from Saudi Arabia showed that that awareness and protection against sun exposure were generally inadequate among the public and suggested the need for health education programs.

The present study aims to investigate the awareness to hazards of sun exposure and use of sunscreen among the general population in Saudi Arabia.

OBJECTIVES

Primary objective: To assess the awareness to hazards of sun exposure and use of sunscreen among the general population in Madinah city, Saudi Arabia.

Secondary objective: To assess whether there is a relationship between overall the awareness to hazards of sun exposure and sunscreen use with gender, residency, or previous experience with skin cancer.

METHODS

Study Design

Observational survey-based cross-sectional study.

Participants and Setting

We included adults' residents in Madinah city of the Kingdom of Saudi Arabia, regardless of sex or nationality. Participants were invited to fill an online-based survey throughout December 2017.

Sample Size and Sampling Method

The sample size was calculated using G*Power (www.gpower.hhu.de/) with 95% confidence level and 5% margin of error. Based on this calculation, the predetermined sample size was 358 participants. We used non-probability convenience sampling technique to collect the predetermined response rate.

Data Collection Instrument

We used an online-based self-administrated questionnaire that was adapted from previous published literature.^[13] A 27-items questionnaire was used to measure the awareness to hazards of sun exposure and use of sunscreen. The questionnaire consists of multiple choice and fill-in-the-blank format questions. The final questionnaire is divided into three sections: 1) demographic information; 2) sun exposure behavior; and 3) subject's habits concerning sunscreen use. The full questionnaire is shown in **Appendix.1**.

Data Entry and Statistical Analysis

The analyses was carried with SPSS software (Statistical Package for the Social Sciences, version 24, SSPS Inc, Chicago, IL, USA). Frequency tables with percentages was used for categorical variables and descriptive statistics (mean and standard deviation) was used for numerical variables. Pearson's Chi-square test was used to analyze categorical variables. A p-value < 0.05 is considered statistically significant.

RESULTS

We collected 611 responses, from which 97% were females. The majority (42.7%) of the participants were between 15 – 25 years old. Almost 92% of the participants were Saudi, and 53% of them were undergraduates. Half of the participants worked indoors without prolonged exposure to sun exposure, and almost 82% of the participants reported one or more skin problems. Sixty-three percent of the participants were taking vitamin D supplementations, and almost all of them reported frequent exposure to other sources of rays than the Sun. **Table.1** shows the demographic characteristics of the participants.

Regarding sun exposure behavior and trends of sunscreen uses, 67.8% of the participants knew that sun exposure predisposition to skin cancer. While, 22.9% reported frequent exposure to the sun between 11am – 3pm, and only 16% reported prolonged daily sun exposure. Almost 90% of the participants knew about the different sunscreen preparations, and 38.9% already use sunscreen frequently. Avoiding skin darkening was the most frequently reported reason to use sunscreen, and 34% of the participants thought that sunscreen is not important. Internet and social media represented the main source of information regarding the hazards of prolonged sun exposure and the benefits of sunscreen (**Table.2**).

There were statistically significant relationships between the use of sunscreen and the presence of skin problems ($p = 0.035$), sources of information ($p = 0.002$), occupation ($p < 0.001$), and the knowledge about the hazardous effect of sun exposure ($p < 0.001$). In addition, there was statistically significant relationship between the nationality and the reported reasons for the non-use of sunscreen ($p = 0.009$) (**Table.3**).

DISCUSSION

Skin cancers are widely considered as preventable conditions by following a number of protective measures, including sunscreen use.^[8] Previous studies have demonstrated the protective effect of sunscreen use on melanoma incidence; regular sunscreen use in adults significantly reduced the incidence of invasive melanomas compared to placebo.^[9, 10] Given the protective effect of regular sunscreen use, it is important to assess the knowledge about and attitude towards the use of sunscreen among the general population.

In the present cross-sectional study, we assessed the awareness to hazards of sun exposure and the use of sunscreen among 611 participants. Our results showed that almost two-thirds

of the participants knew that prolonged sun exposure predisposition to skin cancer. However, only 38% of them already use sunscreen preparations frequently and a considerable part of the participants declared that the use of sunscreen is not important. Internet and social media represented the main source of information regarding the hazards of prolonged sun exposure and the benefits of sunscreen. Moreover, participants who reported skin problems, worked outdoors, and knew the hazardous effect of sun exposure were more likely to use sunscreen preparations.

In concordance with our results, AlGhamdi and colleagues^[12] reported that 55% of the general population in Saudi Arabia were aware of the hazardous effect of prolonged sun exposure, and their association with the increased skin cancer. Similarly, another report^[13] showed that 56% of general population in Qassim Province were aware about the association between sun exposure and skin cancers. However a strikingly higher proportion (87%) were reported to be aware about the association of sun exposure and the development of skin cancer in study of Greece population.^[14] Such high level of awareness was also reported among students of the secondary school in Malta.^[15] This difference between the Saudi and Western population regarding the awareness level seems to be consistent. A high level of awareness was reported in Australia (82%)^[16], US (92%)^[17], and Canada (85%).^[18] We could not identify any published literature that studied the possible causes of such difference between Saudi and Western populations. However, the abovementioned Western studies were conducted mainly on children and teenagers; previous reported have linked a significant association between the high level of awareness of hazards of sun exposure and younger population.^[12, 14, 19]

In the present study, a low proportion (38%) of the participants stated a regular use of sunscreen preparations and 34% declared that the use of sunscreen is not important. AlGhamdi and colleagues^[12] showed 24% of Saudis regularly use sunscreen during their outdoor activities. However, Al-Robae^[13] reported a lower rate (8%) of sunscreen use in Qassim Province. Al-Mutairi and colleagues reported that more than 50% of the general population in Kuwait regularly sue sunscreen preparation with skin protective factor.^[20] Another report showed that 41% of Turkish students stated that they used a sunscreen during outside activities.^[19] Again, a remarkably higher proportion of Western population reported regular sunscreen use.^[14, 16-18]

Outdoor workers are more prone to risks of sun exposure due to their prolonged and high extent exposure.^[21] Therefore, a proper skin exposure and protection behaviors are more critical for this population.^[22] In the present study, outdoors worker represented 25% of the sample, in which 53% of them reported regular sunscreen use. However, this rate of use was significantly lower than indoor workers ($P < 0.001$); and outdoor workers were less likely to be aware about the association between prolonged sun exposure and skin malignancy. Reinau and colleagues conducted a systematic review on 52 studies evaluating outdoor worker sun exposure and protection behaviors. They reported that 30-80% of outdoor workers never or rarely use sunscreen preparations, and their level of awareness about hazards of sun exposure is low.^[23]

The present cross-sectional included a large number of sample size which was comparable to previous similar studies. However, we acknowledge that our study has a number of limitations. We used an online-based questionnaire and non-probability convenience sampling technique to collect the predetermined response rate; which may introduce different type of biases.^[24] In addition, our sample was limited to Madinah city residents only, so we cannot generalize our findings to the general population in Saudi Arabia.

In conclusion, a low number of Madinah population use sunscreen preparations. Awareness campaign and educational program is needed to increase Saudis awareness about the hazards of sun exposure and the beneficial effect of sunscreen use.

CONFLICT OF INTEREST

All authors confirm no financial or personal relationship with a third party whose interests could be positively or negatively influenced by the article's content.

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FIGURES' LEGENDS

Figure 1: shows the number of participants who respond to knowledge about sunburn predisposition to skin cancer.

Figure 2: shows the number of participants who respond to sunscreen uses.

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