

Factors Influencing the Practice of Sun Protection by Medical Students in Saudi Arabia

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ABSTRACT

Sun exposure is considered as one of the most common modifiable risks of skin cancer. The World health organization recommended for continuous protection from ultraviolet radiation by taking several measurements to avoid his potential hazard. The general objective was to explore the knowledge, behavior concerning skin cancer, sun protection, and factors associated with inappropriate use of sun-protection methods among Saudi Arabian medical students.

We represent a descriptive cross-sectional observational study based on an online survey conducted in Saudi Arabia on September-December 2019. The questionnaire consisted of a short demographic form as well as 21 mandatory questions. The questionnaire's link was distributed online to medical students with the help of famous medical students twitter accounts.

Our findings show the knowledge of the participants influences their sun-related behaviors As we can notice, 68.2% of the participants know that sun exposure is the most common skin cancer cause, and therefore, 64.1% use sunscreen on summer-time. The proportion of students who use various methods of sun protection was high; 70.3% don't go out on intense sunlight time, 56.25% of respondents always walk in the shade, 52.6% use sun protection creams, and 41.67% use sunglasses.

The Saudi Arabian medical students have a relatively high knowledge level towards the ultraviolet radiation hazardous and ways of protection.

Keywords

Skin Cancer; Tanning; Knowledge; Attitude; Saudi Arabia.

Introduction

Sunlight has both benefits and risks for human. Literature data shows sunlight is an important factor for vitamin D production in the skin and the prevention of such disorders like osteomalacia, or osteoporosis. Anti-cancer, anti-inflammatory, and beneficial cardiovascular and metabolic effects are found in sunlight. The sun also contributes to preventing several mental conditions, including seasonal disorders, depression, Alzheimer's disease, and migraines.

On the other hand, the Centers for Disease Control and Prevention (CDC) identified sun exposure as one of the most preventable risks of skin cancer in the United States (US).¹ Sunbathing, Sunbed use, and poor sun protection were increased in the last and current decade due to the greater accessibility to go abroad.^{2,3} The popularity of tanning further promotes unsafe sun-related behaviors, especially among the young adult population.⁴ According to the world health organization (WHO), these bad sun-related behaviors are classified as a class 1 carcinogen.⁵ Moreover, it participates in some acute diseases such as sunburn and photodermatitis. Can occur and chronic diseases like melanoma, keratinocyte, and photoaging.⁶⁻⁸ According to the Saudi Cancer Registry, the Age Standardized Incidence Rate (ASR) of melanoma among both genders has declared 0.2.⁹ WHO recommended continuous protection from ultraviolet radiation (UVR) by taking several measurements that include the use of sunscreens with a sun protection factor (SPF) of 30 or higher, sun-protective clothing, sunglasses, wide-brimmed hats, avoiding tanning beds and seeking the shade, especially during the hours of

10 AM and 5 PM.¹⁰

Medical students have an essential role in skin cancer and other sun-related skin diseases primary prevention due to becoming involved in preventative educational activities either directly or through social media.¹¹ A systematic review of Nahar et al demonstrated that medical students had knowledge towards the apparent importance of skin cancer lower compared to other cancer types. Moreover, the authors have reported the sun protecting methods utilization have infrequent among them, and their interest in tanning bed use remained high.¹²

The aim of the present study is to explore the knowledge, behavior concerning skin cancer, sun protection, and factors associated with inappropriate use of sun-protection methods for medical students in Saudi Arabia.

Materials and Methods

Study Design and selection criteria

We have made a descriptive cross-sectional observational study based on an online survey, which was conducted in Saudi Arabia in September-December 2019. All questions were extracted from relevant literature. We have used a convenience sampling method due to the difficulty of random obtaining medical students.

Inclusion and exclusion criteria

There were no restrictions in selection criteria; all eligible medical students were invited to participate after obtaining consent and ethical approval from the Qassim research ethical committee. Refused to participate students were excluded from the study.

Data collection

The questionnaire consisted of a short demographic form as well as 21 mandatory questions. The questionnaire's link was distributed online to medical students with the help of famous medical students twitter accounts.

Statistical analysis

For performing all analyses Microsoft Office Excel 2016 (windows version) was used. Data was entered and coded in order to prepare for analysis. Categorical variables were assessed and described using frequency and percentage. Chi-square test was used to describe any association.

Results

Demographic characteristics

The majority of participants (90.1%) were older than 20 years old. Males consisted about 1/3 of the participants, and 65.58% were female. Most of the students were in the basic sciences years (45.8%) or clinical years (48.4%). Fifty participants (more than 26%) had a skin disease medical diagnosed; however, no one has a family history of any skin cancer (Table 1).

Table 1: Demographic and clinical characteristics of included participants

| Markers | Variables | Responses (n=192) | |
|---------------------------------------------------------|----------------|-------------------|------------|
| | | Person number | Percentage |
| Age | < 18 | 3 | 1.6 |
| | 18-19 | 16 | 8.3 |
| | ≥20 | 173 | 90.1 |
| Gender | Male | 68 | 35.4 |
| | Female | 124 | 64.6 |
| Education level | Basic sciences | | |
| | years | 88 | 45.8 |
| | Clinical years | 93 | 48.4 |
| | Internship | 11 | 5.7 |
| Do you have a skin disease (diagnosed by a doctor) | | | |
| | Yes | 50 | 26 |
| | No | 142 | 74 |
| Did any of your family members suffer from skin cancer? | | | |
| | Yes | 0 | 0 |
| | No | 192 | 100 |

The number of medical students who attended a lecture on ways to protect from the sun was not exceeded by 14% of the included participants. However, 107 (55.7%) students searched the internet for ways to protect from the sun.

Regarding the *causes of skin cancer*, 68.2% of the participants thought that sun exposure is the most common cause of skin cancer. Only 10.4% of students thought that the person with brown skin does not need sun protection. About 64.1% know that using sun protection creams protect against skin cancer, but only 37.5% who know that SPF for sun protection creams should be 30 or more. 25% of the participants thought that there is no need to use sunscreen if the weather is cloudy.

Regarding the *skin tanning*, 71 respondents (37%) agreed that it makes a person more beautiful, 9 respondents (4.7%) had an opinion it protects from sunlight, and 134 (69.8%) had a mind accelerates skin aging. Moreover, 79 (41.1%) said that tanning for the skin in the salons (Tan salon) is not a safe or correct way. Most of the students, 179 (93.2%), thought that sunscreen could not reduce the level of vitamin D in the body (Table 2).

Table 2: Knowledge of Medical Students towards the skin cancer, ultraviolet

| Question | Answer variants | Person number | Percentage |
|-------------------------------------------------------------------------------------|-----------------|---------------|------------|
| Have you ever attended a lecture on ways to protect from the sun? | Yes | 26 | 13.5 |
| | No | 166 | 86.5 |
| Have you ever searched the internet for ways to protect from the sun? | Yes | 107 | 55.7 |
| | No | 85 | 44.3 |
| Is sunlight the main cause of skin cancer? | Yes | 131 | 68.2 |
| | No | 26 | 13.5 |
| | I do not know | 35 | 18.2 |
| Does a person with brown skin do not need sun protection? | Yes | 20 | 10.4 |
| | No | 138 | 71.9 |
| | I do not know | 34 | 17.1 |
| Does using sun protection creams protect against skin cancer? | Yes | 123 | 64.1 |
| | No | 20 | 10.4 |
| | I do not know | 49 | 25.5 |
| Should the SPF for sun protection creams be 30 or more? | Yes | 72 | 37.5 |
| | No | 16 | 8.3 |
| | I do not know | 104 | 54.2 |
| There is no need to use sunscreen if the weather is cloudy (clouds obscure the sun) | Yes | 48 | 25 |
| | No | 105 | 54.7 |
| | I do not know | 39 | 20.3 |
| Tanning of the skin with sun exposure makes the person more beautiful | Yes | 71 | 37 |
| | No | 121 | 63 |
| Tanning of the skin protects it from sunlight | Yes | 9 | 4.7 |
| | No | 149 | 77.6 |
| | I do not know | 34 | 17.7 |
| Sunlight accelerates skin aging | Yes | 134 | 69.8 |
| | No | 11 | 5.7 |
| | I do not know | 47 | 24.5 |
| Tanning for the skin in the salons (Tan salon) is considered a safe and correct way | Yes | 19 | 9.9 |
| | No | 79 | 41.1 |
| | I do not know | 94 | 49 |

The attitude of medical students towards sunlight, skin cancer, and methods of protection.

In terms of using sunscreen summer-time, 27 (14.1%) students always use it, and 96 (50%) use it sometimes. The majority of participants (70.3%) have no go out on intense sunlight time, 56.25% respondents always walk in the shade, 52.6% use sun protection creams, or 41.7% use sunglasses. Regarding the *frequency of sunscreen using*, 83 (43.2%) use it once daily, 13 (6.8%) up to 3 times a day, and 5 (2.6%) every two hours. Only 32 (16.7%) students done a tan for their skin; out of them, 12 (6.25%) using creams that do not need sun exposure and only one student did it in the beauty salon. On the other hand, 28 (14.6%) students did not use sunblock as it takes time and effort, 26 (13.5%) persons because of its expensive, and 13 (6.77%) had no important (Table 3).

Table 3: Attitude of Medical Students towards the Sunscreen, tanning, and skin

| Question | Answer variants | Person number | Percentage |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------|------------|
| Did you use sunscreen on summer-time? | Always | 27 | 14.1 |
| | Sometimes | 96 | 50 |
| | Never | 69 | 35.9 |
| Which of the following sunscreen do you use most? | Always walk in the shade | 108 | 56.25 |
| | Not going out during times of intense sunlight | 135 | 70.3 |
| | Sun Glasses | 80 | 41.7 |
| | Sun protection creams | 101 | 52.6 |
| | Wear long clothes | 66 | 34.4 |
| Do you take care to avoid the sun's rays from 10 am to 2 pm? | Yes | 130 | 67.7 |
| | No | 62 | 32.3 |
| Have you ever done a tan for your skin? | Yes | 32 | 16.7 |
| | No | 160 | 83.3 |
| If you have ever did a tan, which of the radiations, and skin protection following methods did you use? | Direct exposure to the sun | 38 | 19.8 |
| | Scans in beauty salons | 1 | 0.5 |
| | Using creams that do not need sun exposure | 12 | 6.25 |
| If you use sunscreen, how often do you use them daily? | Every two hours | 5 | 2.6 |
| | Once daily | 83 | 43.2 |
| | 2-3 times/day | 13 | 6.8 |
| If you do not use sunblock creams, choose the reason for this? | There is no specific reason | 71 | 37 |
| | It takes time and effort | 28 | 14.6 |
| | Expensive | 26 | 13.6 |
| | Not important | 13 | 6.8 |
| I do not use sunscreen because it reduces the vitamin D rage? | Yes | 13 | 6.8 |
| | No | 179 | 93.2 |

Statistical Analysis

Education level was associate with better understanding for sun block using ($P=0.009$). Besides, those who tended to search the internet tended to use it more, too ($P=0.001$). Gender was not associated with any better knowledge or change in attitude ($P=0.993$)

Discussions

In this study, we aimed to explore the knowledge and attituded of Saudi Arabia medical students towards sun-related behaviors and to ways of sunshine protection. The results of our findings showed that the knowledge of respondents influences their sun-related behaviors. So, we can notice, 68.2% of the participants know that sun exposure is the most common cause of skin cancer, but just 64.1% use sunscreen in summer-time. The proportion of students who use various methods of sun protection was high. 70.3% of respondents have no go out on the intense sunlighttimes, 56.25% always walk in the shade, 52.6% use sun protection creams, and 41.7% use sunglasses. On the other hand, only 16.7% of the

students had done a tan for their skin. Similarly, Scott et al.,¹³ showed that 70% of Australian medical students indicated they always or sometimes use sunscreen protective measures in time outdoor activities summer-time. Moreover, Isvy et al.¹¹ reported more than $\frac{2}{3}$ of the medical students were knowledgeable with the general aspects of sun-protection measures. However, they emphasized the importance of educational programs for medical students to be able to educate their future patients. In Peru, Rodriguez-Gambetta et al.¹⁴ showed a high knowledge level among medical students. They reported that more than 90% of the students were able to identify that UVR is the most frequent cause of skin cancer and know that there is no difference between white and black populations in terms of the necessity of using sun protection measures. They declared a good sun-related behavior, as 66.9% walk in shadows, 12.4% use an umbrella, 28.8% don't go out on higher radiation hours, 17.7% use hats/caps, and 8.0% use long sleeves.

Our findings were in contrast with those of Kirk and Greenfield who found that the knowledge UK university students towards the risk of skin cancer did not strongly influence their sun-related behaviors. They explained that the main motivator is the body image. Moreover, they showed that these bad behaviors were stemmed from family, peers, media, and from childhood habits¹⁵. Therefore, any further awareness programs should be directed to these important domains (family and community). This disagreement between our findings and theirs can be explained by the difference between sittings, educational background, population, and environment¹⁶⁻¹⁸.

Due to the lack of knowledge in relation to sunscreen use and UV-protective behaviors, medical students may have no adequate knowledge to promote the message them patients of effective sun protection in future. While previous literature showed a high degree of importance in the prevention of skin cancer, the tanned skin also showed a high value among medical students. Scott et al. showed that among Australian medical students 28% had tanned, no matter to their knowledge of the skin cancer risk. Moreover, they demonstrated a significant difference between both genders; females tend more likely to use tan. Nevertheless, they showed a higher percentage of always or often wear sunscreen in the summer when compared to males¹³. Another study reported a higher adherence to recommended protection measures especially in those who attended skin protection workshops¹⁴. These findings were consistent with previous published studies, where men use sunglasses less often.¹⁹⁻²⁰

Conclusion

Our study had some limitations such as the selected population was well-educated medical students with a greater interest in knowledge compared to the general Saudi Arabians. Moreover, the design to assess the sunscreen using and other variables were chosen through an electronic survey, which can be subjected to recall bias.

Saudi Arabian medical students have a relatively high knowledge level towards the UVR hazardous and ways of protection. This knowledge influenced their sun-relative behavior and motivated them to protect themselves against the risk of skin cancer. Cooperation between the medicals, policymakers, and concerned authorities is needed to set educational programs suite the children, their parents, and other patients.

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References

- [1] Center for disease control and prevention. Skin cancer [Internet]. 2020 [cited 2020 Jan 1]. Available from: https://www.cdc.gov/cancer/skin/basic_info. Subscription required.
- [2] Parkin, D. M., Mesher, D., & Sasieni P. (2011). Cancers attributable to solar (ultraviolet) radiation exposure in the UK in 2010. *Br J Cancer*, 105(S2), S66–9.
- [3] Grunfeld, E. A. (2004). What influences university students' intentions to practice safe sun exposure behaviors? *J Adolesc Heal*, 35(6), 486–92.
- [4] Williams, M., Caputi, P., Jones, S. C., & Iverson, D. (2011). Sun Protecting and Sun Exposing Behaviors: Testing Their Relationship Simultaneously with Indicators of Ultraviolet Exposure Among Adolescents. *PhotochemPhotobiol*, 87(5), 1179–83.
- [5] El Ghissassi, F., Baan, R., Straif, K., Grosse, Y., Secretan, B., & Bouvard, V. (2009). A review of human carcinogens—Part D: radiation. *Lancet Oncol*. 10(8), 751–2.
- [6] Menshaw, A., Eltonob, A. A., Barkat, S. A., Ghanem, A., Mniesy, M. M., Mohamed, I., et al. (2018). Nivolumab monotherapy or in combination with ipilimumab for metastatic melanoma. *Melanoma Res*, 28(5), 371–9. doi: <https://doi.org/10.1097/CMR.0000000000000467>.
- [7] Bahbah, E. I., Fathy, S., & Negida, A. (2019). Is Alzheimer's disease linked to Herpes simplex virus type 1 infection? A mini-review of the molecular correlation and the possible disease connections. *Clin Exp Neuroimmunol*, 10(3), 192–196.
- [8] Amaro-Ortiz, A., Yan, B., & D'Orazio, J. (2014). Ultraviolet Radiation, Aging and the Skin: Prevention of Damage by Topical cAMP Manipulation. *Molecules*, 19(5), 6202–6219.
- [9] Registry, S. C. (2017). Saudi Cancer Registry Cancer Incidence Report Saudi Arabia, 2014. *Saudi Cancer Regist*, 2017, 1–28.
- [10] Lee, T., & Diao, D. (2014). Sun-protective behaviors in populations at high risk for skin cancer. *Psychol Res Behav Manag*. 7, 8–19. doi: [10.2147/PRBM.S40457](https://doi.org/10.2147/PRBM.S40457).
- [11] Isvy, A., Beauchet, A., Saiag, P., & Mahé, E. (2013). Medical students and sun prevention: knowledge and behaviours in France. *J Eur Acad Dermatology Venereol*, 27(2), e247–51.
- [12] Nahar, V. K., Wilkerson, A. H., Ghafari, G., Martin, B., Black, W. H., Boyas, J. F., et al. (2018). Skin cancer knowledge, attitudes, beliefs, and prevention practices among medical students: A systematic search and literature review. *Int J Women's Dermatology*, 4(3), 139–49. doi: <https://doi.org/10.1016/j.ijwd.2017.10.002>
- [13] Scott, A. J., Harris, V., Lee, A., & Smith, S. D. (2017). Assessment of sun-protective attitudes and behaviours of Australian medical students. *J Eur Acad Dermatology Venereol*, 31(11), e497–8.
- [14] Rodríguez-Gambetta, P., Moscoso-Porras, M. G., & Taype-Rondan, A. (2016). Factors associated with regular sunscreen use by medical students of a Peruvian university. *J Prev Med Hyg*, 57(3), E172–7.
- [15] Kirk, L., & Greenfield, S. (2017). Knowledge and attitudes of UK university students in relation to ultraviolet radiation (UVR) exposure and their sun-related behaviours: a qualitative study. *BMJ Open*, 7(3), e014388.
- [16] Zuba, E. B., Francuzik, W., Malicki, P., Osmola-Mańkowska, A., & Jenerowicz, D. (2016). Knowledge about Ultraviolet Radiation Hazards and Tanning Behavior of Cosmetology and Medical Students. *Acta Dermatovenereol Croat*, 24(1), 73–77.

- [17] Iglesias-Puzas, Á., Méndez Iglesias, M., Diéguez Montes, M. P., &Flórez, Á. (2019). Assessment of sun-related behaviour, knowledge and attitudes among nursing students. *PhotodermatolPhotoimmunolPhotomed*, 35(5), 304–312.
- [18] Gambla, W. C., Fernandez, A. M., Gassman, N. R., Tan, M. C. B., &Daniel, C. L. (2017). College tanning behaviors, attitudes, beliefs, and intentions: A systematic review of the literature. *Prev Med (Baltim)*, 105, 77–87.
- [19] Livingston, P. M., White, V. M., Ugoni, A. M., &Borland, R. (2001). Knowledge, attitudes and self-care practices related to sun protection among secondary students in Australia. *Health Educ Res*, 16(3), 269–278.
- [20] Cokkinides, V. E., Johnston-Davis, K., Weinstock, M., O’Connell, M. C., Kalsbeek, W., Thun, M. J., et al. (2001). Sun exposure and sun-protection behaviors and attitudes among U.S. youth, 11 to 18 years of age. *Prev Med (Baltim)*, 33(3), 141–151.
- [21] Rodnyansky, D.V., Abramov, R.A., Repin, M.L., Nekrasova, E.A. Estimation of innovative clusters efficiency based on information management and basic models of data envelopment analysis*International Journal of Supply Chain Management*, 2019, 8(5), c. 929-936
- [22] Abramov, R. A. (2016). Regional economic policy based on industrial sector clustering in the context of sustainable. *Research journal of pharmaceutical, biological and chemical sciences*, 7(2), 2100-2106.
- [23] AgarunovichR.A. Management functions of integrative formations of differentiated nature. *Biosciences Biotechnology Research Asia*, 2015, 12(1), c. 991-997
- [24] Akhmetshin E., Morozov I., Pavlyuk A., Yumashev A., Yumasheva N., Gubarkov S. (2018). Motivation of Person-nel in an Innovative Business Climate, *European Research Studies Journal* Volume XXI Issue 1, 352-361. DOI: 10.35808/ersj/953