



# Prevalence of Tanning among Medical and Non-medical Students in Jeddah, Saudi Arabia

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### Abstract

**Background:** Tanning is described as the transformation of skin colour to brown or bronze. This process is often caused by exposure to ultraviolet radiation by the sun or artificial sources. Exposure to ultraviolet radiation is considered the primary risk factor for skin damage and skin cancer. However, a few studies were conducted to estimate the prevalence of tanning in Saudi Arabia. Therefore, we aimed to assess the prevalence of tanning among medical and non-medical students in Jeddah, Saudi Arabia.

**Methods:** Ethical approval was obtained from the Institutional Review Board (IRB) of Fakeeh care. A descriptive cross-sectional study was conducted among medical and non-medical university students in Jeddah, Saudi Arabia. During the academic year of 2019-2020. A validated questionnaire was distributed via an online survey. Students with any dermatological problems preventing them from tanning were excluded. We consider P-value=0.05 statically significant and the Confidence Interval (CI) is 95% by using the Chi-square test.

**Results:** Almost 63.1% (n=422) of our participants reported practicing skin tanning. Half of them were outdoor tanners 50.1% (n=335), 11.5% (n=77) were self-tanners, and 1.5% (n=10) were indoor tanners. On the other hand, 35.6% (n=238) of the participants did not tan at all. 1.3% (n=9) preferred not to say.

**Conclusions:** Our study showed that college students from both genders are significantly interested in tanning. Outdoor tanning was the most preferred method. The results of this study emphasize the critical need to create community-counseling campaigns to increase awareness about tanning and its relationship with skin cancer and photoaging. Counseling health education that focuses on the importance of sunscreen use, especially among males. Sunless tanning products should be promoted.

### Keywords

Tanning, Skin Damage, Skin Cancer, Ultraviolet

## Introduction

Tanning is the process of changing the skin colour to bronze [1]. A process that is often caused by some level of exposure to ultraviolet radiation by the sun or the artificial sources includes tanning lamps

labelled as indoor tanning beds and devices found in tanning salons, gyms, and spas [2]. When the skin is exposed to ultraviolet radiation it increases the production of melanin pigment to protect the skin from further damage [1]. Another method used is self-tanning, which refers to a suntan's effect from products such as sprays and lotions without exposure to ultraviolet radiation. Ultraviolet radiation is a significant contributing factor for skin cancer [3,4], the most prevalent form of cancer worldwide, and has witnessed a recent increase in cases [5,6], it is ranked 9th among cancer types in Saudi Arabia [2]. The World Health Organization has considered that indoor tanning devices as carcinogen [7]. Many epidemiologic studies have suggested that indoor tanning devices has risk factor for melanoma and non-melanoma skin cancers, including Basal Cell Carcinoma (BCC) and Squamous Cell Carcinoma (SCC) [3].

Self-tanning is widely considered a safe method of tanning because it contains dihydroxyacetone that reacts with skin proteins and amino acids to elicit its skin colouring effect, in a chemical reaction known as "Maillard reaction" [8,9]. Thus, Ultraviolet (UV) light exposure is not needed to initiate this chemical reaction [10]. Ultraviolet Radiation (UVR) may enhance skin cancer in several ways, including damage to the DNA in cells of the skin leading to abnormal growth in the cells, or by weakening the immune system and the body's defence mechanisms against cancer cells [1]. There are two types of UV radiation that affects human health, UVA and UVB radiation [4]. UVA has primarily effect on skin aging or "photoaging" which is caused by breaking down the collagen and elastin fibers in the skin results in wrinkled skin or dark spots [1]. UVA has also been associated with the development of skin cancer [4]. The other type is UVB which penetrate deeper layers in the skin resulting in sunburns and skin cancer [4]. Using sunscreen is one way to protect the skin from the harmful effects of UV radiation [11].

In the United Kingdom, a sample study from the population revealed that at least 90% of melanoma cases in men and 82% in women were notably due to excess exposure to Ultraviolet radiation [2]. There were studies in the United States that illustrated indoor tanning popularity among female students aged 18 or older [12]. The increase in using an indoor method (sunbed) is because it is easier to get the colour that you want even before the summer [13-19]. Another study included 6803 teenagers. 82% used spray/cream or direct exposure to the sun, and 4.4% used a tanning device [20]. Local studies conducted in the eastern province among female college students revealed that the younger female population is significantly interested in tanning. Most of the community preferred outdoor tanning [1].

A cross-sectional study included 316 university students selected from King Abdulaziz University, King Saud University, and Albaha University. Only 13.3% of them have never practiced sunbathing for more than 30 minutes during summer, while 22.4% are always sunbathed. The majority of the students (86.4%) have never used a tanning bed, while only 1.9% still uses a tanning bed [21]. A study conducted In Makkah Al Mukarramah among 960 females their age ranged between 14 and 23 years. Showed that 20.2% of them confessed to tanning. 60.2% want to stop their tanning, and 66.2% are aware that tanning behaviour is dangerous [22].

Although a few studies were conducted to estimate the prevalence of tanning in Saudi Arabia. Therefore, we aimed to assess the

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prevalence of tanning among medical and non-medical students in Jeddah, Saudi Arabia.

### Methodology

Ethical approval was obtained from the Institutional Review Board (IRB) of Fakeeh care. A descriptive cross-sectional study was conducted among medical and non-medical university students in Jeddah, Saudi Arabia. During the academic year of 2019-2020.

The total calculated sample size was 350 participants by using the “Roasoft sample size calculator.” A validated questionnaire was distributed via an online survey in which informed consent was taken from participants [23]. The questionnaire consisted of demographic data (age, gender, nationality, marital status, specialty, and the academic year). Questions about their practices of tanning and tanning behaviour, such as how many times have the participants gotten a spray tan or used tanning beds and devices or purposely spend more than 30 minutes outside with the intention of tanning their skin. In addition to questions about using sun protection methods. Students with any dermatological problems that prevent

them from tanning were excluded. Data entry was done by Microsoft Excel, while analysis was done by using SPSS version 25. Chi-square test was used to assess the relationship between the variables.

### Results

The study aimed to assess the prevalence of tanning among medical and non-medical college students in Jeddah, Saudi Arabia. In the current cross-sectional study, 741 students participated; 72 were excluded on account of having dermatological problems that prevent them from tanning, in addition to participants who were above 27 years and below 17 years. Total 669 students remained, most of whom were female 67.7% (n=453) and 32.3% (n=216) were males. Fifty one percent (n=343) were medical and 48.7% (n=326) were non-medical, with a mean age of 21.13, S.D ± 1.85 (Table 1).

Almost 63.1% (n=422) of our participants reported practicing skin tanning. Half of them were outdoor tanners 50.1% (n=335), 11.5% (n=77) were self-tanners, and 1.5% (n=10) were indoor tanners. On the other hand, 35.6% (n=238) of the participants did not tan at all. 1.3% (n=9) preferred not to say (Figures 1-3).

Table 1		Demographic data		
		Female	Male	Total=n
Nationality	Saudi	412	41	586
	Non-Saudi	174	42	83
Total=n		453	216	669
Specialty	Medical	225	228	343
	Non-medical	118	98	326
Total=n		453	216	669
Academic year	1 <sup>st</sup> year	67	25	92
	2 <sup>nd</sup> year	76	33	109
	3 <sup>rd</sup> year	109	34	143
	4 <sup>th</sup> year	123	59	182
	5 <sup>th</sup> year	43	30	73
	6 <sup>th</sup> year	35	35	70
Total=n		453	216	669
Marital status	Single	440	211	651
	Married	13	5	18
Total=n		453	216	669

Frequency test

Table 1: Prevalence of tanning among medical and non-medical college students.

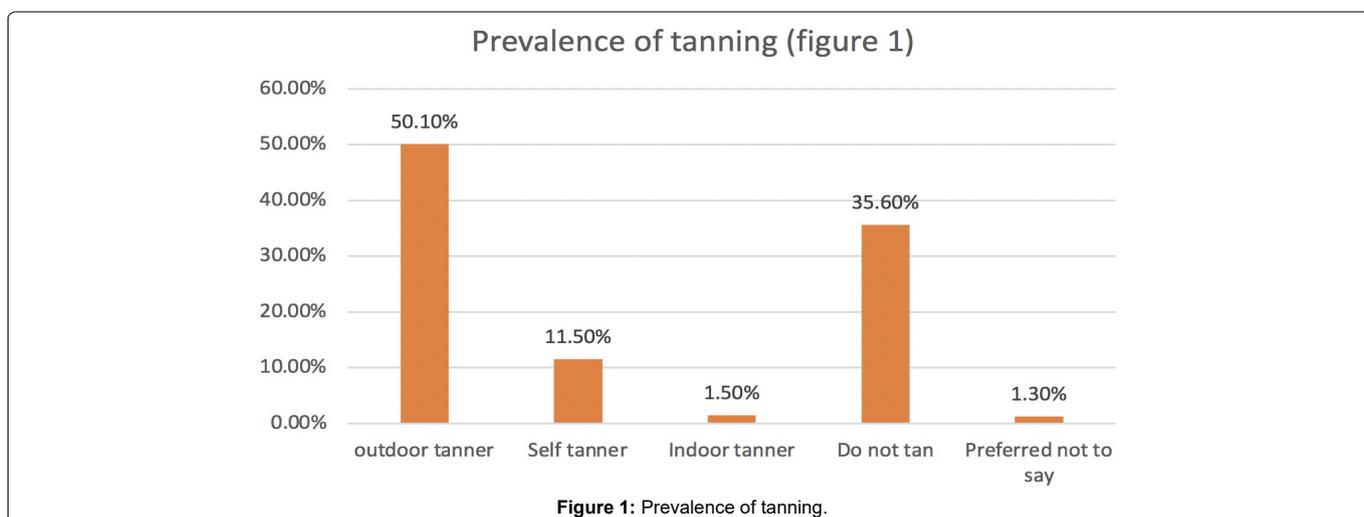


Figure 1: Prevalence of tanning.

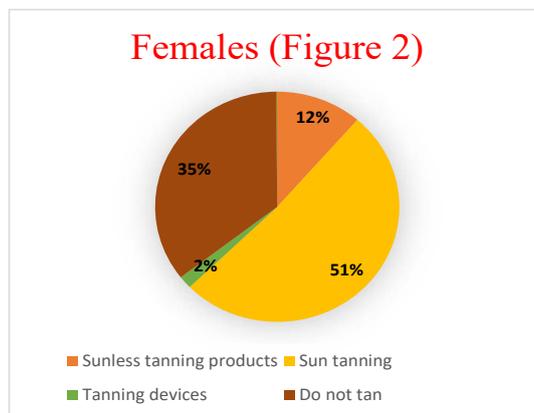


Figure 2: Females.

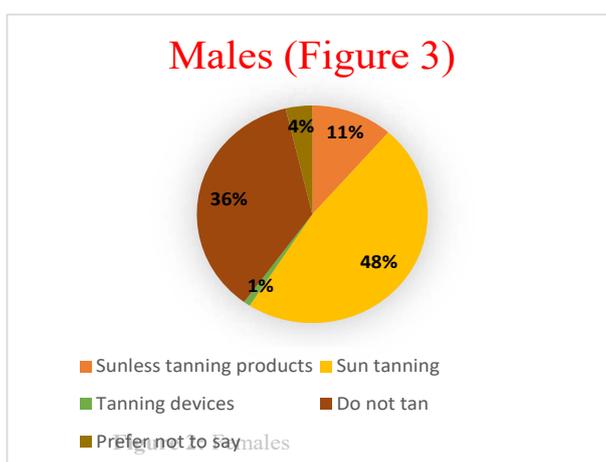


Figure 3: Males.

Table 2		Gender	
		Male	Female
Prevalence of tanning		19.40%	43.60%
P-value		0.021	
Sunscreen use	Always	2.70%	11.40%
	Most of the time	2.80%	13.50%
	Sometimes	3.70%	14.90%
	Rarely	6.30%	13.50%
P-value		Less than 0.001	
SPF level	SPF 50 or more	4.90%	26.20%
	SPF 30-49	2.20%	9.70%
	SPF 11-29	2.50%	4.30%
	SPF 10 or less	2.40%	5.80%
P-value		Less than 0.001	
Chi-square test			

Table 2: The relation between gender and tanning, sunscreen use, and SPF level.

When asked about the reason not to tan, a large percentage 37.7% preferred the colour of their normal skin, 11.1% because of the risks of tanning and ultraviolet radiation, and 23.3% of the students did not have free time to tan. About 24.2% of our participants reported spending 30 minutes outdoor purposely to tan, 49.4% of respondents

mentioned using sunblock rarely or never. There was a statistically significant relationship between gender and tanning (P-value=0.021). However, most of the individuals that participated in this research were females and that may have had an impact of this correlation showed in (Figures 1 and 2). No relationship was observed between

Table 3		Specialty	
		Medical	Non-medical
Prevalence of tanning		32.40%	30.60%
P-value		0.147	
Sunscreen use	Always	7.50%	6.60%
	Most of the time	8.10%	8.20%
	Sometimes	9.40%	9.30%
	Rarely	9.30%	13.30%
P-value		0.69	
SPF level	SPF 50 or more	14.90%	16.10%
	SPF 30-49	7.00%	4.90%
	SPF 11-29	4.30%	2.50%
	SPF 10 or less	4.60%	3.60%
P-value		0.213	
Chi-square test			

**Table 3:** The relation between specialty and tanning, sunscreen use, and SPF level.

specialty and tanning (P-value=0.147). Females significantly used sunscreens in comparison to males (P-value<0.001) in addition to (Sun protection factor) SPF level, most of which favoured SPF-50 or more (P-value<0.001).

In contrast, there was no significant relationship between specialty and sunscreen use (P-value = 0.690), as well as specialty and (Sun protection factor) SPF level (P-value=0.213). Regarding the tanning method, there was a significant relationship between gender and the use of sunless tanning products at home (P-value=0.002); 19.4% of females used sunless tanning products in comparison to 6.2% of males. No statistical relation was found between specialty and the use of sunless tanning products (P-value=0.540). There was no significant relationship between both gender and specialty with the help of a tanning bed (P-values=0.375, 0.591) (Tables 2 and 3).

## Discussion

In this study, we aim to assess the prevalence of tanning among medical and non-medical college students in Jeddah, Saudi Arabia.

Sixty-three percent (n=422) of our participants reported practicing skin tanning. Half of them were outdoor tanners 50.1% (n=335), 11.5% (n=77) were self-tanners, and 1.5% (n=10) were indoor tanners. Our findings reveal an incredibly high prevalence of tanning among female students (43.6%) than males (19.4%). A previous study done in the Gulf Coast of the United States complied with our findings (24), which reflects gender being the most influencing factor affecting tanning behaviour. We believe that these similarities are attributed to appearance reasons such as enhancement of physical attractiveness and to appear less pale.

Outdoor tanning was the most prevalent method of tanning among our sample. Although another study conducted in Jeddah, Saudi Arabia, showed that suntan was not prevalent, as most participants did not believe sun tan increasing attractiveness [5]. This point is possibly due to the difference in beauty standards, which varies from one to another.

Our study revealed that 24.2% of the students purposely spend 30 minutes of outdoor intending to tan their skin. Sixty-seven percent of university students selected from King Abdulaziz University, King Saud University, and Albaha University thought that 30 minutes in the sun in the middle of the day in summer is not risky [21]. Overall, participants exposed to Ultraviolet radiation for tanning may be at more risk for skin cancer [2]. Regarding sun safety practices,

we found that 68.8% of the participants use sunscreen. Most of them were females, 53.3% and 15.5% were males. We suppose it is because women are more familiar with the sun's detrimental effects, including being concerned about skin aging and damage. The finding that women use sunscreen more often than men has been reported by many studies [24,25]. Besides, female students could be wearing makeup with Sun Protection Factor (SPF). Therefore, we believe that men are the critical risk group for sunburn due to their lack of sunscreen use. The use of tanning beds among our sample is not common. The majority of the students, 96.6%, have never used a tanning bed in their entire life, which is identical to the previous findings in Saudi Arabia [1,5,21,22]. Compared to results in other countries, 70% of the Norwegian National Population participants reported ever use of indoor tanning devices [26]. Among the US population, 22.6% of the sample screened positive for indoor tanning dependence [27]. The dissimilarities could be explained due to the lack of tanning devices in Saudi Arabia.

One of the studies has revealed that 44.6% of Saudi students knew that tanning beds might cause skin cancer [21], which could be one of the contributing causes. We also found a significant relationship between gender and the use of sunless tanning products at home (P-value=0.002). 19.4% of females used sunless tanning products in comparison to 6.2% of males. No relationship was found between specialty and any tanning method, which means tanning, is popular among our sample regardless of the specialty and the knowledge they have about it and the risks involved.

There are many myths in Saudi Arabia regarding sun exposure. Such as, in order to get vitamin D from the sun, you need to be exposed to the sun without using sunscreen, while in reality using sunscreen is essential when being exposed to the sun. We can get vitamin D by following healthy diet and by taking vitamin D supplements. Another myth a tan every now and then would not be so harmful, while tanning affects the skin, even when not so frequent [5]. Due to the global health crisis and covid-19 pandemic, many people could not tan at the beach regarding the circumstances, the majority of our respondents were females compared to males which might had an impact of our results. Self-report and social desirability bias may have affected the results.

## Conclusion

Our study showed that college students from both genders are significantly interested in tanning. Outdoor tanning was the most

preferred method. The results of this study emphasize the critical need to create community-counseling campaigns to increase awareness about tanning and its relationship with skin cancer and photoaging. Counseling health education that focuses on the importance of sunscreen use, especially among males. Sunless tanning products should be promoted.

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