ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Guarding Skin Health: Exploring Sun Exposure Knowledge, Attitude, Practice And Perception Among Medical And Non-Medical Students.

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ABSTRACT

Excessive Ultraviolet radiation exposure from the sun is a serious risk to skin health, leading to DNA damage, and mutations. Sunscreens play an important role in reducing these risks by blocking or reducing the penetration of UV radiation. The objective was to assess and compare the knowledge, attitude, practice, and perception regarding sun-exposure and sunscreen use among medical and non-medical students. This cross-sectional study was conducted between both medical and non-medical students in online mode, using a questionnaire via Google Forms. A total of 101 medical and 102 non-medical students filled out the questionnaire. Cronbach's Alpha of 0.833 indicated good questionnaire reliability. While no significant difference existed in overall knowledge scores between the groups, significant disparities were found in specific questions. While both groups understood sunscreen's role, attitude and practice variations were notable, with non-medical students demonstrating greater confidence and proactive behaviour towards sun protection. Medical students struggled to incorporate sunscreen into their routine. Non-medical students were more likely to adhere to recommended practices and medical students were more willing to change practices with more information. This study highlights the differences in sun protection knowledge, attitude, practice, and perception between medical and non-medical students, with emphasis on targeted educational interventions.

Keywords: KAPP, SPF, Sunlight, Sunscreen, UV-Rays.

https://doi.org/10.33887/rjpbcs/2024.15.3.34

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INTRODUCTION

Excessive Ultraviolet (UV) radiation exposure from the sun is a serious risk to skin health, leading to DNA damage, and mutations causing conditions such as Basal Cell Carcinoma (BCC), cutaneous Squamous Cell Carcinoma (cSCC), and premature aging [1-3]. Although direct DNA damage by UVB radiation has been well established, further investigation into the contribution of UVA radiation to skin cancer is required [3]. Sunscreens made of active ingredients that absorb and/or reflect UV light can play an important role in reducing these risks by blocking or reducing the penetration of UV radiation [4].

Historically, the efficacy of sunscreens was observed when salicylates were able to reduce the effects of sunburn [4]. Over time, physicians, public health agencies, and non-profit organizations have promoted chemical sunscreen, including protective clothing, as a mainstay of sun protection. Despite these efforts, a section of the population still says that sunscreen should not be used or not used consistently or inappropriately [5,6,7,8]. Health care professionals, comprising of medical students, physicians, and nurses, have an opportunity to influence sun protection practices among their patients and community [9], hence it being important for them to have the right knowledge, attitude, practice, and perception.

The main aim of this study was to assess and compare the knowledge, attitude, practice, and perception regarding sun exposure and sunscreen use among medical and non-medical students.

MATERIALS AND METHODS

This cross-sectional study was conducted among both medical and non-medical students. The study was conducted online, utilizing Google Forms as the platform for data collection, by convenience sampling due to the accessibility and ease of reaching out. It was not confined to any particular institution but was spread across various peer groups and acquaintances of the researchers. This strategy allowed for efficient data collection from medical and non-medical student populations. Before commencing the study, ethical clearance was obtained from the Institutional Ethical Committee at M.V.J Medical College and Research Hospital, number MVJMC&RH/IEC-99/2023, dated 05-08-2023.

In this study, a Medical Student (MS) is defined as a student enrolled in the 1st to 4th year of MBBS who hasn't started his/her internship, and a Non-Medical Student (NMS) is defined as an undergraduate student pursuing a course unrelated to healthcare.

The questionnaire consisted of 45 Questions divided into five sections, the first section was demography comprising details like name, age, sex, course, and year of study. Other sections of knowledge, attitude, practice, and perception, had 10 questions each made to assess various aspects of sunscreen usage among the participants.

The questionnaire was validated by two experts in the field of dermatology, and the remarks they gave were used to revise the questions. A pilot study was conducted with 20 students selected at random to find the reliability of the questionnaire, these 20 responses were excluded from the main study.

The decided sample size was a minimum of 100 MSs and 100 NMSs. A total of 203 responses were collected, consisting of 101 MSs and 102 NMSs. All the participants were informed prior about the purpose of the study, their consent was obtained and measures were taken to safeguard the identity of the participants throughout the research.

The collected data was analyzed using SPSS Version 20.0 for Windows. A chi-square test was done to determine associations between categorical variables with P Value ≤ 0.05 being considered significant. The analyzed data was tabulated and appropriate graphs were made.

RESULTS

After the pilot study, a reliability test was done using SPSS Version 20.0, and a Cronbach's Alpha of 0.833 was obtained. So, the questionnaire has good reliability, enhancing the credibility of this study's findings.

ISSN: 0975-8585

A total of 203 responses were received of which 101(49.75%) were MS and 102 (50.25%) were NMS. Among them 90 (44.33%) were male and 113 (55.66%) were females.

Table 1

Sl. No	Questions	Correct Responses		P Value
		Medical	Non-Medical	
1	What are the potential adverse effects of prolonged sun exposure on the skin? (Select all that apply)	47	27	*0.003*
2	Sunscreen protects the skin against harmful UVA and UVB rays.	92	87	*0.201*
3	How often should sunscreen be reapplied when spending extended periods outdoors?	69	72	*0.725*
4	Which SPF (Sun Protection Factor) level provides the best protection against harmful UV rays?	17	33	*0.010*
5	Which time of day is the sun's UV rays most intense and damaging to the skin?	83	73	*0.073*
6	What is the primary cause of sunburn after prolonged sun exposure?	64	50	*0.039*
7	What are the recommended sun protection measures besides using sunscreen? (Select all that apply)	18	35	*0.007*
8	What is the relationship between skin type and sun sensitivity?	82	40	*0.000*
9	Which age group is at the highest risk of developing skin cancer due to sun exposure?	26	6	*0.000*
10	Tanning beds are a safe alternative to sun exposure for getting a tan.	49	64	*0.041*
Average Score		5.416	4.775	*0.774*

Table 1 shows the frequencies of correct answers for the knowledge section of the participants. There wasn't a significant difference in the average scores of MS and NMS (*P Value=0.774*). A significant difference was seen in questions 1, 4, 6, 7, 8, 9, and 10 (*P Value < 0.05*); Figure 1.A. The highest number of correct responses was for question no.2 and the lowest was for question no.9. More than 85% (MS: n=92, 91.09%; NMS: n=87, 85.29%) of participants of each group knew that sunscreen protects the skin against harmful UVA and UVB rays. Less than 26 % (MS: n=26, 25.74%; NMS: n=06, 05.88%) of participants in each group knew that elderly adults (>60 years) were at the highest risk of developing skin cancer due to sun exposure.

Table 2

Sl.no	Questions	Responses		P Value
		Medical	Non-Medical	
1	How concerned are you about the potential harmful effects of sun exposure on your skin?			*0.6045*
	a. Very concerned	28	34	
	b. Moderately concerned	51	45	
	c. Slightly concerned	18	21	
	d. Not concerned at all	4	2	
2	How important do you think it is to use sunscreen regularly when going outside?			*0.485*
	a. Extremely important	32	30	
	b. Fairly important	49	44	
	c. Neutral	16	25	
	d. Not important	4	3	
3	How confident are you in your ability to identify the right type of sunscreen for your skin?			*0.026*
	a. Very confident	5	16	
	b. Somewhat confident	39	45	
	c. Not very confident	38	30	
	d. Not confident at all	19	11	

4	Do you believe that wearing sunscreen daily can prevent skin cancer and premature aging?			
	a. Yes, absolutely	29	42	*0.0214*
	b. Maybe, to some extent	68	50	
	c. No, not at all	4	10	
5	How likely are you to seek shade or use protective clothing during peak sun hours?			
	a. Very likely	34	51	*0.0545*
	b. Somewhat likely	50	43	
	c. Unlikely	13	5	
	d. Never	4	3	
6	What are the main factors influencing your decision to use sunscreen regularly? (Select all that apply)			
	a. Fear of skin cancer	50	63	*0.6454*
	b. Desire to prevent premature aging	64	69	
	c. Recommendations from healthcare professionals	60	63	
	d. Influence of friends/family	41	52	
	e. Media and advertising	26	42	
7	In your opinion, how challenging is it to incorporate sunscreen use into your daily routine?			
	a. Very challenging	26	13	*0.0213*
	b. Somewhat challenging	39	36	
	c. Not challenging	36	53	
8	How often do you read the labels and instructions on sunscreen products before using them?			
	a. Always	25	24	*0.9533*
	b. Often	36	39	
	c. Rarely	28	29	
	d. Never	12	10	
9	Do you think that people of your age and background generally care about sun protection?			
	a. Yes, most of them do	42	29	*0.0932*
	b. Some do, some don't	52	60	
	c. No, not many care	7	13	
10	Would you be willing to spend more on higher-quality sunscreen products for better protection?			
	a. Yes, definitely	35	58	*0.0061*
	b. Maybe, depends on the price difference	57	37	
	c. No, I would stick to lower-priced options	9	7	

Table 2 shows the frequencies of responses for the attitude section of the participants. In this section responses to 4 Questions were found to be significant; question no.3, 4, 7, and 10. Significantly more NMSs said that they were very / somewhat confident in their ability to identify the right type of sunscreen for their skin (Figure 1.B), they absolutely believe that wearing sunscreen daily can prevent skin cancer and premature aging (Figure 1.C) and that they are willing to spend more on higher-quality sunscreen products for better protection whereas the price difference matters more for MSs (Figure 1.E). MSs said they find it very/somewhat challenging to incorporate sunscreen into their daily routine (Figure 1.D).

ISSN: 0975-8585

Table 3				
Sl.no	**Questions**	**Responses**		**P Value**
		Medical	**Non-Medical**	
1	How frequently do you use sunscreen when going outdoors on a sunny day?			*0.079*
	a. Always	20	27	
	b. Often	24	36	
	c. Sometimes	23	21	
	d. Rarely	19	9	
	e. Never	15	9	
2	On average, how much sunscreen do you apply per use?			*0.007*
	a. Less than the recommended amount	61	42	
	b. Recommended amount (teaspoon for face & neck, shot glass for body)	37	49	
	c. More than the recommended amount	3	11	
3	How do you usually apply sunscreen? (Select all that apply)			*0.0004*
	a. Evenly on all exposed skin	31	34	
	b. Only on the face	65	37	
	c. Only on the body	5	6	
	d. Mostly on sun-sensitive areas (nose, cheeks, shoulders)	18	43	
4	Do you reapply sunscreen after swimming or sweating heavily?			*0.1621*
	a. Always	7	11	
	b. Sometimes	22	29	
	c. Rarely	33	37	
	d. Never	39	25	
5	How frequently do you seek shade or use protective clothing during peak sun hours?			*0.0003*
	a. Always	22	44	
	b. Often	40	19	
	c. Sometimes	19	28	
	d. Rarely	12	9	
	e. Never	8	2	
6	Have you ever used indoor tanning beds or artificial tanning methods to get a tan?			*0.0508*
	a. Yes	8	17	
	b. No	93	85	
7	How often do you check your skin for any unusual moles, spots, or changes?			*0.2848*
	a. Regularly (at least once a month)	36	26	
	b. Occasionally (every few months)	34	36	
	c. Rarely (once a year or less)	19	29	
	d. Never	12	11	
8	Do you encourage your friends or family to use sunscreen and practice sun protection?			*0.2024*
	a. Yes, always	32	29	
	b. Sometimes	39	36	
	c. Rarely	19	31	
	d. No, never	11	6	

9	How did you learn about the importance of using sunscreen and protecting your skin from the sun?			
	a. School/College education	16	25	*0.1132*
	b. Healthcare professionals	23	31	
	c. Family/Friends	31	26	
	d. Media (TV, internet, etc.)	31	20	
10	If you forget to apply sunscreen and experience sunburn, what do you usually do?			
	a. Seek medical advice immediately	26	43	*0.072*
	b. Apply after-sun lotions and remedies	39	34	
	c. Ignore it and hope it goes away	31	23	
	d. Other (please specify)	5	2	

Table 3 shows the response frequencies for the participants' practice section. In this section responses to 3 Questions were found to be significant; question no.2, 3, 5. Many MSs use less than the recommended amount of sunscreen (Figure 1.F), and mostly over their face (Figure 1.G). In contrast, NMSs use the recommended amount mostly over sun-sensitive areas (nose, cheeks, shoulders). A significant number of NMSs always /often /sometimes seek shade or use protective clothing during peak sun hours, than MS (Figure 1.H).

Table 4

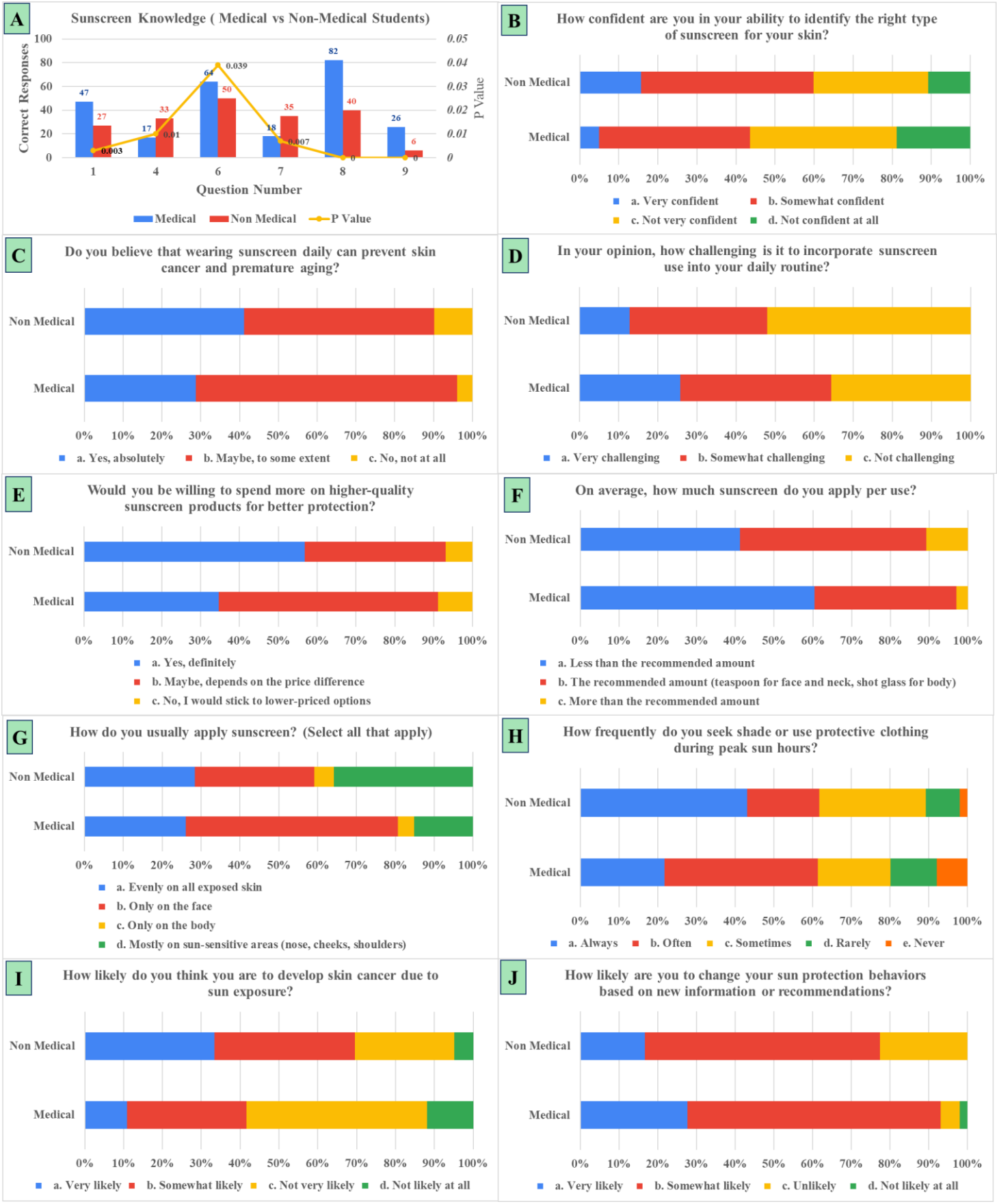
Sl.no	Questions	Responses		P Value
		Medical	Non-Medical	
1	How likely do you think you are to develop skin cancer due to sun exposure?			
	a. Very likely	11	34	*0.0001*
	b. Somewhat likely	31	37	
	c. Not very likely	47	26	
	d. Not likely at all	12	5	
2	How concerned are you about the long-term effects of sun exposure on your skin's appearance?			
	a. Very concerned	28	29	*0.7239*
	b. Somewhat concerned	46	50	
	c. Slightly concerned	18	18	
	d. Not concerned at all	9	5	
3	How do you perceive the effectiveness of sunscreen in preventing skin damage?			
	a. Highly effective	21	25	*0.8108*
	b. Moderately effective	54	56	
	c. Slightly effective	24	19	
	d. Not effective at all	2	2	
4	How do you view the importance of sun protection in comparison to other health-related behaviors (e.g., diet, exercise)?			
	a. Equally important	66	61	*0.5152*
	b. Less important	32	35	
	c. More important	3	6	

5	Do you think people in your age group underestimate the risks of sun exposure and its effects on the skin?			
	a. Yes, most do	44	34	*0.2143*
	b. Some do, some don't	51	57	
	c. No, not many underestimate	6	11	
6	How confident are you that you can identify early signs of skin damage caused by the sun?			
	a. Very confident	8	13	*0.5091*
	b. Somewhat confident	51	43	
	c. Not very confident	38	40	
	d. Not confident at all	4	6	
7	How do you perceive the social norms related to using sunscreen and practicing sun protection?			
	a. Most people around me use sunscreen and protect their skin	17	22	*0.6904*
	b. Some people use sunscreen, but many ignore sun protection	71	68	
	c. Very few people care about sunscreen and sun protection	13	12	
8	How likely are you to change your sun protection behaviors based on new information or recommendations?			
	a. Very likely	28	17	*0.001*
	b. Somewhat likely	66	62	
	c. Unlikely	5	23	
	d. Not likely at all	2	0	
9	How confident are you that you can influence your peers to adopt better sun protection habits?			
	a. Very confident	15	19	*0.1028*
	b. Somewhat confident	59	49	
	c. Not very confident	17	29	
	d. Not confident at all	10	5	
10	In your opinion, how well does your current sun protection routine align with your desired level of skin health and appearance?			
	a. Very well	13	14	*0.0504*
	b. Moderately well	49	55	
	c. Not very well	27	31	
	d. Not well at all	12	2	

Table 4 shows the response frequencies for the participants' perception section. In this section responses to 2 Questions were found to be significant; question no.1, 8. NMSs were much more likely to think they would develop skin cancer due to sun exposure (Figure 1.I), whereas MSs were much more likely to change their sun protection behavior based on new information or recommendations (Figure 1.J).

ISSN: 0975-8585

Figure 1



DISCUSSION

In this study, the knowledge, attitude, practice, and perception regarding sunscreen was assessed and compared among MSs and NMSs. There was nearly the same amount of representation from each of the two groups.

In terms of knowledge, there wasn't much difference in the average score of the participants of both groups. Both MSs and NMSs showed a good understanding of sunscreen's role in protection against UVA and UVB rays *(P Value=0.201)*, but they lacked awareness of the elderly having the highest risk of developing skin cancer due to sun exposure *(P Value=0.000)*. Significantly fewer NMSs knew that lighter skin tones are more sensitive to the sun than darker skin tones, but knew that SPF 100 provides the best protection against harmful UV rays *(P Value=0.010)*. As per Sander et al [10]., SPF is a measure of how effective a sunscreen is at preventing UVB rays from affecting the skin.

Attitude-wise, NMSs showed a lot more confidence in choosing the better sunscreen and were willing to spend more on good quality sunscreen. This confidence and proactive attitude shown by NMSs may come from an awareness of the role and risk of UV rays in skin damage. In a study by Al-Naggar et al [11]., majority of participants said that the best alternative to prevent skin cancer is sunscreen. On the other hand, MSs find it difficult to even incorporate sunscreen into their daily routine, which could be due to their busy academic and clinical responsibilities.

By practice, many MSs use less than the recommended amount of sunscreen, that too mostly over their face, whereas NMSs use the recommended amount over sun-sensitive areas and are more likely to seek shade or use protective clothing during peak sun hours as recommended by Diaz et al [12]. This discrepancy emphasizes the need for targeted education particularly among MSs who will become doctors. As per Faurschou et al [13]., not following proper guidelines can reduce the efficiency of sunscreen application.

Perceptually, NMSs showed more concern about developing skin cancer due to sun exposure, and MSs are more willing to change their sun care practices provided more information is given. The main strength of this study is the use of a validated questionnaire and rigorous statistical analysis to increase its credibility. However, the reliance of this study on self-reported data and the use of convenience sampling may introduce bias and limit the generalizability of the results. Moreover, a cross-sectional design for this study arrests the establishment of causal relationships among the variables involved. According to a study by Babu et al [14]., vitamin D3 is primarily produced in our body due to UVB rays obtained from sunlight exposure, and is crucial for our health, with dietary sources playing only a small role, particularly in India. Even though sunscreen use is important for skin protection, it should be considered judiciously to balance UVB absorption for vitamin D synthesis, based on individual factors such as preferences, sunlight exposure, climate, and geographic location.

In conclusion, this study sheds light on the gaps between medical and non-medical students in terms of sun protection knowledge, attitude, practice, and perception. Although both the groups demonstrated a basic understanding of sunscreen use, there are notable differences in their behaviour and attitude. These findings showcase the importance of targeted educational interventions, especially among medical students who play an important role in highlighting the promotion of sun-safe practices among patients and communities.

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