A Survey of Medical Students' Knowledge of Skin Cancer and Sun Protection

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Background

Skin cancer is regarded as the most common cancer in the United States despite screening being relatively non-invasive and sun-protective products readily available. Numerous studies indicate that medical students lack knowledge regarding skin cancer and sun protection. As future providers, it is vital that medical students appreciate the seriousness of skin cancer and how to prevent sun damage. Thus, the purpose of this study is to assess the extent of medical students' understanding of sun-protective practices and general skin cancer knowledge.

As previous research has suggested, we predict medical students will lack basic and advanced knowledge of skin cancer and sun protection.

Methods

Noorda-COM medical students were recruited to complete a voluntary, anonymous 27-question survey consisting of "quiz" style questions addressing skin cancer, benign or pre-malignant lesions, sun protection, and previous experience with skin cancer or dermatology. Survey questions are either original or adapted from a published survey.

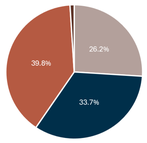
Age, gender, hometown population size, and skin type according to the Fitzpatrick classification are collected to analyze trends between demographics and correct answers. Class year and previous dermatological experience may identify participants' background knowledge.

Statistical analyses were performed using a linear mixed model to evaluate a significant difference between groups of students (i.e., Pre-clinical v. Clinical) and the total number of correct answers. Furthermore, a logistic regression was conducted to compare the performance of Pre-clinical v. Clinical students on individual questions. P value set as < 0.05.

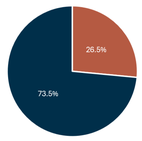
NoordaCOM IRB approval: #23-0007E

Sample Survey Questions

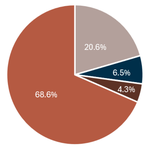
1. **The most common skin cancer is:**
   a. Basal cell carcinoma*
   b. Squamous cell carcinoma
   c. Melanoma
   d. Kaposi sarcoma



2. **Squamous cell carcinoma is the least serious type of skin cancer.**
   a. True
   b. False*



3. **Physical sunscreens may include which ingredient?**
   a. Oxybenzone
   b. Iron Oxide
   c. Homosalate
   d. Zinc Dioxide*



Results

Survey period: Over 6 months with 279 responses collected. Response rate of 50.82%.

Analysis of Linear Mixed Model		
	Clinical vs. Pre-clinical group	White vs. Non-white group
	P value	P value
Year of School	0.0087*	0.023*
Caucasian	-	0.031*
Gender	0.617	0.261
Skin Type	0.296	0.965
Dermatology Experience	0.164	0.042*
Size of Hometown	0.2	0.5

Table 1. Clinical and White students demonstrated higher scores. Using a linear mixed model, the total number of correct answers among the clinical vs. Pre-clinical and White vs. Non-White groups were evaluated. Individuals who identified as mixed raced were excluded as they could fall into either category. Select co-variants were taken into consideration and are displayed in the left column.

Comparison of Clinical vs. Pre-clinical by Question	
Question	P value
Q2. Average # of moles	0.029*
Q3. Most common skin cancer	0.0006*
Q4. Actinic keratoses develop into SCC	0.647
Q5. Adequately protected from UV rays with thin cloud cover	0.265
Q8. ABCDs of melanoma	0.0143**
Q10. Effectiveness of sunscreen for skin cancer prevention	0.67
Q14. Recommended level of SPF	0.00015**

Table 2. A logistic regression was utilized to compare the performance of Clinical vs. Pre-clinical students on several questions. *Clinical students performed significantly better or **significantly worse compared to Pre-clinical.

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Skin Related Demographics (N=279)		
Family history of skin cancer	Yes	35.12%
	No	59.85%
	I Don't Know	5.02%
Do you see a dermatologist?	Yes	26.88%
	No	73.12%
Experience in dermatology*	Yes	6.45%
	No	93.55%
Interested in dermatology**	Yes	4.30%
	No	95.70%

Table 3. Number of students who answered Yes/No. All percentages are the number of students who answered yes or no out of the total number of responses. *Experiences prior to medical school. **Pursuing dermatology following medical school.

Fitzpatrick skin classification	
Skin Type	# Responses
Always burn and never tan	19
Usually burn and tan with difficulty	66
Sometimes mildly burn and tan with ease	144
Never burn and always tan	44
Do not know	3

Table 4. Participants self-reported skin type perceptions.

Student Involvement according to Class Year		
	Responded to survey	Total # of students
Class 2025	4	73
Class 2026	65	125
Class 2027	110	206
Class 2028	99	173
Total	278	577

Table 5. Response rate by classes.

Conclusion

1. Our analysis suggests that students in their clinical years demonstrated a significantly greater understanding of skin-related topics compared to those in their pre-clinical years. Regardless, clinical students indicated a poor understanding of certain topics such as proper application of sunscreen, sun-protective clothing, the ABCDs of melanoma, and an increased risk of melanoma in individuals with many moles.

2. Interestingly, students categorized as "white" earned higher scores on the quiz which may reflect familiarity with dermatological concepts due to personal experience with sun burns or skin cancer. This difference in knowledge highlights the need for all students to be familiar with skin care considering they will care for patients with diverse backgrounds and skin tones.

3. We conclude that the standard curriculum addressing skin cancer increases students' knowledge of the topic, but likely lacks the depth needed to care for patients. To address this deficit, we plan to create an online course available to medical students that addresses the basics of skin care.

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