ORIGINAL ARTICLE

Preventive Behaviors of Nursing Students Toward Skin Cancer: A Cross-Sectional Study

Shahad Sabah Khudhair*, Haneen Qahtan Abadi, Aqelah Mohmmed Hashim, Mithal Yaseen Abed, Zineb Hussien, Noor Ali Mohammed

Department of Nursing, College of Nursing, University of Kerbala, Kerbala, Iraq

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Abstract- Skin cancer is an emerging public health challenge worldwide, and nurses are pivotal in preventing and detecting this disease. It is crucial to evaluate the skin cancer knowledge and preventive behavior of nursing students. This study aimed to determine the level of knowledge and prevention behaviors on skin cancer among nursing students and to determine the relationship between the variables of knowledge, prevention behaviors, and selected demographic variables. Cross-sectional descriptive research was carried out from November 2024 to April 2025 among undergraduate nursing students at the College of Nursing, University of Karbala, Iraq. Sixty undergraduate nursing students constituted the purposive sample. The data were collected using a structured 20-item questionnaire consisting of 8 preventive behaviors and 12 knowledge questions, scored on a uniform five-point Likert scale. The content validity was assessed through expert review, and good reliability was confirmed by high Cronbach's alpha (α=0.87). Data analysis was performed using SPSS version 27. Non-normality of distribution was determined via the Kolmogorov-Smirnov test, which led to employing the Spearman correlation and multiple linear regression. Most of the participants had moderate levels of preventive practices (98.3%) and knowledge (95%). There was no statistically significant relationship between the participants' knowledge and their preventive practices (r=0.044, *P*=0.737). There were no statistically significant effects of demographic factors on preventive practices (*P*>0.05). Nursing students demonstrated moderate levels of knowledge and preventative practice; however, there are still deficiencies in terms of early detection techniques. There is need to reinforce structured education and training approaches in nursing courses.
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Introduction

Skin cancer is considered one of the most common types of cancer in the world, with rates still increasing in many areas. As per the most recent statistics provided by GLOBOCAN 2022, both melanomas and non-melanomas have emerged as considerable oncological challenges (1). Although they share similar names, different types of skin cancers exhibit diverse characteristics in terms of pathology, clinical manifestations, and treatment methods (2). The clinical classification of skin cancers includes melanoma, derived from melanocytes, and NMSCs, which consist of basal cell carcinomas (BCCs) and cutaneous squamous cell carcinomas (cSCCs). Although BCCs are the most common form of skin cancer and tend to be localized, cSCCs and melanomas have a higher chance of developing metastasis and are associated with poor prognosis in their late stages (2,3).

UV radiation is considered an essential risk factor in the development of both melanomas and non-melanoma skin cancer, depending on the dose of the rays, which can cause DNA damage, resulting in skin cancers (1,3).

In recent years, there have been dramatic advances in therapy for high-risk or advanced disease. Targeted therapies, especially BRAF and MEK inhibitors for

Corresponding Author: Sh.S. Khudhair
Department of Nursing, College of Nursing, University of Kerbala, Kerbala, Iraq
Tel: +964 7737721360, E-mail address: shahad.s@uokerbala.edu.iq

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BRAF-mutant melanoma, have significantly improved outcomes (4). In parallel, immunotherapy using immune checkpoint inhibitors (e.g., anti-PD-1, anti-CTLA-4) has transformed the prognostic landscape, offering durable responses in many patients (4). Nonetheless, despite these therapeutic milestones, the continuing burden of skin cancer underscores the importance of public health strategies focused on prevention and early detection (1,3). Although there is increasing incidence of skin cancers globally and it is known that preventive behaviors are important for their reduction, the literature on the level of awareness and preventive behaviors of nursing students in Iraq is sparse. While many studies have been conducted worldwide to assess awareness and protective practices against sun exposure among nurses or university students, the setting or education environment can play an influential role on prevention skills. Currently, only few studies have addressed the issue on knowledge and preventive behaviors in the context of Iraqi nursing students. This study then sought to evaluate the level of knowledge and practice of prevention among nursing students towards skin cancer, as well as the correlation of knowledge and practice of prevention with selected demographic factors.

Materials and Methods

Study design and setting

A descriptive cross-sectional study was conducted at the College of Nursing, University of Karbala, Iraq, from November 1, 2024, to April 20, 2025.

Participants and sampling

The sampling technique used to select a sample size of 60 nursing undergraduate students from different levels of education was purposive sampling. Purposive sampling was employed because it facilitated the selection of participants who have certain attributes of interest according to the aims of the study; specifically, students whose educational exposure to nursing had equipped them with enough knowledge concerning skin conditions. The sample included 60 students. The sample size was calculated with the help of G*Power using an expected medium effect size of r=0.30, α=0.05, and β=0.80. A minimum of 52 participants was required to attain a statistically significant relationship between variables.

The study instrument and data collection

Data were collected using a structured, two-part questionnaire:

•Part One assessed sociodemographic characteristics, including age, gender, and academic level (3 items).

•Part Two consisted of a revised skin cancer questionnaire (5) containing 20 items, divided into two domains: 1. Preventive behavior domain – 8 items assessing participants' preventive practices toward skin cancer. 2. Knowledge domain (12 items) assessing participants' knowledge of skin cancer.

Each item was scored on a five-point Likert scale: 1=strongly disagree, 2=disagree, 3=somewhat agree, 4=agree, and 5=strongly agree.

Validity and reliability

Content validity was achieved after the instrument was evaluated by a team of five experts on dermatology and health nursing for adults. These experts evaluated the content validity of the items of the questionnaire in terms of relevance, clarity, and appropriateness, and changes were made before collecting the data. Reliability testing was done using Cronbach's alpha with a value of 0.87.

Statistical data analysis

The data is to be analyzed and examined using SPSS version 27. The descriptive statistical methods which include frequency counts and percentages, as well as the central tendencies and dispersion of the data are to be used. Moreover, inferential statistical tools which would be appropriate for the distribution of the data will also be used. The Kolmogorov-Smirnov (K-S) test will further be used to determine the type of distribution the data follows, whether normal or non-normal. The study protocol was accepted by the College of Nursing ethical committee at the University Kerbala (code: UOK.CON.026.0117). An informed consent has been documented for each student, and all student inform that they have the right to withdraw at any moment.

Results

This section gives the results of the current study in tabular form and their relation to the aims of the research as indicated in the tables: As presented in Table 1, that out of the total 60 nurses surveyed, majority (58.3%) of them fall in the age group of 22 to 24 years. In terms of gender, majority (55%) of them were male. As per the educational level, majority (30%) The results in Table 2 showed that the assessment of the preventive behaviors of nursing students toward skin cancer was moderate, with a mean of 2.81 (Min-Max 1-5). The higher percentage that showed in the item number 2, with a mean of 3.97 and the lower percentage showed in the item

number 8, with a mean of 1.63. Results from Table 3 revealed that the majority percentage of total score level of preventive behavior of nursing students towards skin cancer was moderate with mean score value of 22.52 (Min-Max 8-40). The results in Table 4 showed that the assessment of the level of knowledge of nursing students about skin cancer was moderate, with a mean of 3.21 (Min-Max 1-5). The higher percentage that showed in the item number 6, with a mean of 4.48 and the lower percentage showed in the item number 2, with a mean of 1.83. The results in Table 5 showed the total scores of level of knowledge of nursing students about skin cancer at majority (95%) was moderate, with a mean of 38.57 (Min-Max 12-60). In Table 6 the results showed there were non-significant statistical relationship between students' knowledge and their preventive behaviors at $P>0.05$.

Table 7 presents the influence of demographic characteristics (age group, sex, and academic stage) on preventive behaviors among the study participants. Regarding age group, the findings indicate that participants aged 19–21 years had a slightly higher mean score for preventive behaviors (M=2.86) compared to those aged 22-24 years (M=2.78). However, this association was not statistically significant (β= .232, P=.410), indicating that age group did not significantly influence preventive behaviors.

With respect to sex, both male and female participants demonstrated identical mean scores (M=2.81). The regression analysis showed no statistically significant relationship between sex and preventive behaviors (β=−.029, P= .821).

In terms of academic level, Stage 1 students reported a significantly higher mean (M=2.88) than Stage 4 students who had the lowest mean score (M=2.71). However, there were no significant associations found between academic level and preventive behaviors among adolescents (β= −.471, P= .098). While the probability value for academic level was close to being significant, it still surpassed the criterion.

Table 1. Distribution of the nursing students based on their socio-demographic data characteristics

Demographic Characteristics	Subgroup	f.	%
Age group	19 - 21 years	25	41.7
	22 - 24 years	35	58.3
	Total	60	100.0
Sex	Male	33	55.0
	Female	27	45.0
	Total	60	100.0
Academic stage	Stage 1	12	20.0
	Stage 2	13	21.7
	Stage 3	18	30.0
	Stage 4	17	28.3
	Total	60	100.0

f= frequencies, %=Percentages

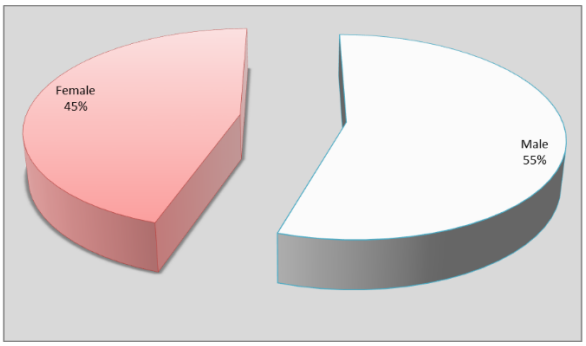

Figure 1. Percentage of sex for the participants

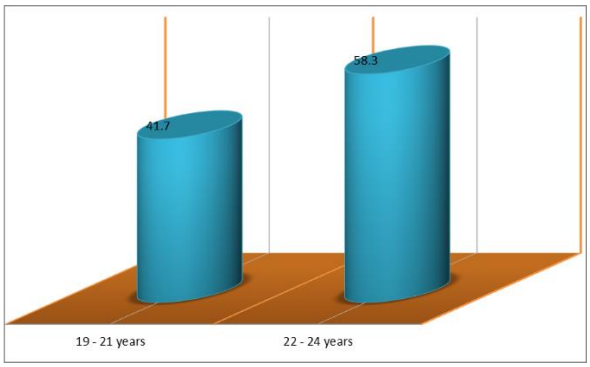

Figure 2. Percentage of age group for the participants

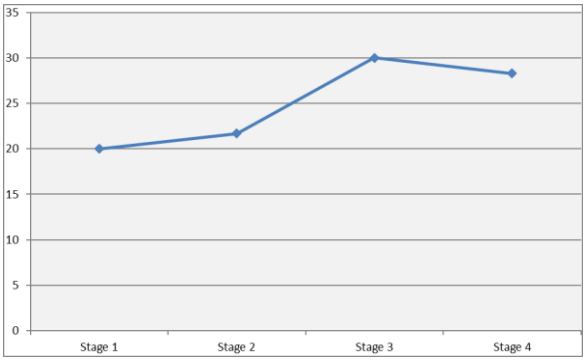

Figure 3. Percentage of stage for the participants

Table 2. To assess the preventive behaviors of nursing students toward skin cancer

Items		Mean	Ass.
1.	**Q1**	2.12	L
2.	**Q2**		
3.	**Q3**	3.97	H
4.	**Q4**	1.98	L
5.	**Q5**	3.90	H
6.	**Q6**	3.65	M
7.	**Q7**	2.72	M
8.	**Q8**	2.55	M
9.	**Q9.**	1.63	L
Overall		2.81	M

Ass. = Assessment items, L = Low (1 – 2.33), M = Moderate (2.34 – 3.66), and H= High (3.67 - 5).

Table 3. Total scores of level of the preventive behaviors of nursing students toward skin cancer

Level	Range	f.	%	Min	Max	Mean	S.D
Low preventive	8 - 18	1	1.7				
Moderate preventive	19 – 29	59	98.3				
High preventive	30 - 40	0	0				
Total	8 - 40	60	100.0	18	26	22.52	1.692

f= frequencies, %=Percentages, M = Mean of score, S.D = Standard Deviation, Min= minimum and Max= maximum

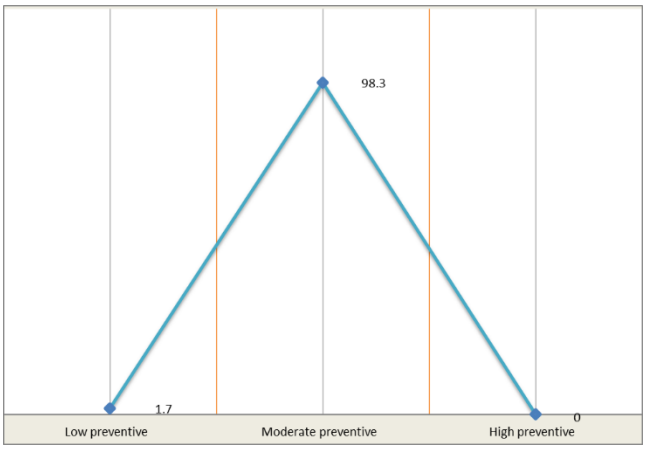

Figure 4. Percentage of level of preventive behaviors of nursing students toward skin cancer

Table 4. To evaluate the level of knowledge of nursing students about skin cancer:

	Items	Mean	Eva.
1.	**Q1**	3.40	M
2.	**Q2**	1.83	P
3.	**Q3**	2.33	P
4.	**Q4**	4.20	G
5.	**Q5**	3.42	M
6.	**Q6**	4.48	G
7.	**Q7**	2.52	M
8.	**Q8**	4.08	G
9.	**Q9**	2.37	M
10.	**Q10**	3.60	M
11.	**Q11**	2.22	P
12.	**Q12**	4.12	G
Overall		3.21	M

P = Poor (1 – 2.33), M = Moderate (2.34 – 3.66), and G= Good (3.67 - 5).

Table 5. Total scores of level of knowledge of nursing students about skin cancer

Level	Range	f.	%	Min	Max	Mean	S.D
Poor	12 - 27	0	0				
Moderate	28 – 43	57	95.0				
Good	44 - 60	3	5.0				
Total	12 - 60	60	100.0	31	45	38.57	2.919

f= frequencies, %=Percentages, M = Mean of score, S.D = Standard Deviation, Min= minimum and Max= maximum

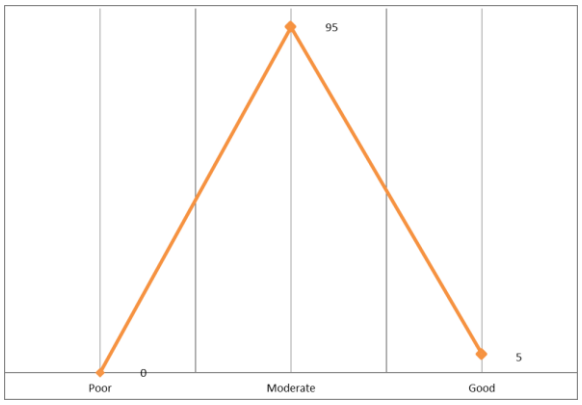

Figure 5. Percentage of total scores of level of knowledge of nursing students about skin cancer

Table 6. The relationship between students' knowledge and their preventive behaviors

N=60	Knowledge	
	Cc	Sig.
Preventive Behaviors	.044	.737

Cc. Spearman's correlation coefficient = Standardized Beta, *P*=probability value, NS: Non-Significant at P ≥ 0.05, S: Significant

Table 7. The influence of demographic characteristics (age, sex, academic year) on preventive behaviors

Data	Subgroup	Preventive Behaviors		
		Mean	β	Sig.
Age group	19 - 21 years	2.86	.232	.410
	22 - 24 years	2.78		
Sex	Male	2.81	-.029-	.821
	Female	2.81		
Academic stage	Stage 1	2.88	-.471-	.098
	Stage 2	2.85		
	Stage 3	2.85		
	Stage 4	2.71		

β = Standardized Coefficients Beta, P=probability value, NS: Non-Significant at *P*≥ 0.05.

Discussion

Based on the results of the sociodemographic analysis, it was found that most of the nursing students in the sample group fall within the ages of 22-24 years, where most are males and at their third year. Such findings reflect the demographic profile of the sample chosen for the research and further suggest that the more advanced the level of students, the more they are familiar with theoretical and practical concepts of health. The results of the current study are consistent with those of a previous study at the College of Nursing, which showed that most nursing students were aged 22-24 years, and that males constituted the largest percentage in the sample. A clear distribution of students in advanced academic stages, such as the third year, was also observed.

Table 3 shows that the preventive behaviors of nursing students regarding skin cancer were mostly at an average level. This level indicates that the students have some knowledge and awareness of the importance of preventive measures. This is consistent with a study in Turkey that found varying levels of preventive behaviors among nursing students, with positive behaviors being less prevalent than negative ones, indicating a lack of full adherence to preventive measures among the students (6). These findings are further supported by another study among university students in the UAE, which demonstrated a moderate level of sun protection practices despite average knowledge, with variations in the application of preventive behaviors (7). Table 5 shows that the majority (95%) of nursing students had a moderate level of knowledge about skin cancer, indicating a basic understanding of risk factors and prevention methods without reaching an advanced level. In contrast, a recent study from Turkey found that nursing students' knowledge about skin cancer and sun exposure was above average, reflecting a difference in awareness levels between different study groups and highlighting the influence of educational or training factors on knowledge (8). Although the results of the current study, as shown in Table 7, did not demonstrate a statistically significant effect of demographic characteristics, including age, gender, and academic year, on preventive behaviors among nursing students, a large-scale study conducted among nursing students in the Aegean region revealed significant differences in knowledge and preventive behaviors based on these characteristics. It was observed that the students who were in the higher-level academic year and with fair complexion had better scores in terms of knowledge as well as preventive behavior (9).

Limitations

There are certain weaknesses associated with this research. For instance, the limited number of participants (n=60) might affect the reliability of the results. Additionally, the research was carried out in one university only and thus cannot give an insight into how nursing students in other places perform. Lastly, the use of self-report questionnaires is subjective because the subjects can give inaccurate information due to response and social desirability biases. Nursing students exhibited moderate levels of knowledge and preventive behaviors regarding skin cancer. Nevertheless, notable gaps were

identified in early detection practices, particularly regular skin self-examination. No statistically significant associations were observed between knowledge, preventive behaviors, or demographic variables. These findings highlight the need for structured educational interventions and practical training within nursing curricula to enhance preventive competencies and promote early detection practices.

Recommendation

In light of the identified gaps in preventive practices, it is recommended that nursing education emphasize structured practical training focused on early detection skills, especially skin self-examination. Strengthening the practical integration of preventive behaviors within existing coursework may help improve students' application of knowledge in real-life contexts.

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