

RESEARCH

Nurse practitioners' knowledge and practice regarding malignant melanoma assessment and counseling

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Abstract

Purpose: To evaluate the knowledge base and clinical practices of nurse practitioners (NPs) within the states of Illinois and California regarding malignant melanoma.

Data sources: Data sources included responses to a 57-item self-administered questionnaire and 15-item demographic survey. A convenience sample of 93 certified NPs from Illinois and California, aged 27–68 years, participated in the study. Participants responded to questions relating to knowledge of malignant melanoma preventive measures, risk factors, barriers to performing malignant melanoma assessments, and lesion recognition.

Conclusions: Overall, the NPs in this study demonstrated adequate knowledge about malignant melanoma but conducted general skin and malignant melanoma assessments less than half of the time and provided patient teaching about preventive measures and risk factors only occasionally. While California NPs demonstrated significantly greater knowledge about malignant melanoma than the Illinois NPs, they performed less skin and malignant melanoma assessments and provided less teaching. The most frequently cited barrier to performing malignant melanoma examinations for both states was time constraints.

Implications for practice: NPs can play a pivotal role in reducing the morbidity and mortality of malignant melanoma through competent skin assessments and patient education and encouraging patients to pursue healthy lifestyles. Improving NPs' assessment skills and knowledge about malignant melanoma, however, is critical to achieving this goal.

Introduction

Malignant melanoma, the deadliest form of skin cancer and the most common skin cancer among people 25–29 years old, is one of the most prevalent cancers in the United States (American Cancer Society [ACS], 2003, 2006). Melanoma is a malignant tumor of melanocytes that can appear suddenly anywhere on the body without warning and can quickly spread to the lymph nodes and other body organs. During the 1970s, the incidence of malignant melanoma increased approximately 6% per year, and since 1981, the incidence has increased by a rate of 3% per year (ACS,

2006). In 2002, the lifetime probability of developing malignant melanoma was 1 in 52 for males and 1 in 77 for females. Current estimates are that more than 62,190 persons will be diagnosed with, and 7,910 will die from, malignant melanoma in 2006 (ACS, 2006). With early detection and proper treatment, however, the disease can be highly curable with a 5-year relative survival rate of 92% and a 10-year relative survival rate of 85% (ACS, 2006).

Although public service campaigns have been initiated to help achieve the Healthy People 2010 goal of reducing the number of new malignant melanoma cases as well as the illness, disability, and death caused by the disease (U.S.

Department of Health and Human Services, 2000), current literature reveals that a significant number of individuals continue to experience excessive sun exposure and sunburns and regularly frequent tanning beds, thereby increasing their risk for developing this deadly cancer (ACS, 2006; Lucci, Citro, & Wilson, 2001). Nurse practitioners (NPs) can play a pivotal role in increasing public awareness about the dangers of these and other risk factors and the importance of regular skin assessments by performing thorough patient assessments and patient teaching. It is unknown, however, whether NPs are well prepared to provide this type of vigilant assessment and patient education. In fact, few studies have examined the knowledge base and practices of NPs regarding malignant melanoma and, of the studies involving other healthcare practitioners, conflicting results are noted. The purpose of this study, therefore, was to examine the knowledge base and clinical practices of NPs related to screening and prevention of malignant melanoma.

Literature review

The PRECEDE–PROCEED conceptual model for health promotion and evaluation (Green & Kreuter, 1991) guided this study. This model is composed of two series of steps or phases. The PRECEDE portion of this model includes a diagnostic framework for identifying key factors that are linked to either negative or positive health indicators, thereby allowing for the development of specific health promotion and education interventions, and objectives and criteria for their evaluation. In the PROCEED portion of the model, additional steps guide the development of policy and the implementation and evaluation of the intervention. This model provided a perspective for exploring and explaining the role and practice behaviors of the NP in relationship to detection and prevention of malignant melanoma. Specifically, by exploring the predisposing factors (basic malignant melanoma knowledge), reinforcing factors (continuing education regarding malignant melanoma and number of years of NP practice/experience), and enabling factors (clinical practice behaviors, assessment skills, time constraints, and other barriers) which may affect the NP's practice, supportive educational and administrative interventions/strategies could be developed and implemented to improve the NP's clinical practice relative to malignant melanoma.

Involvement of healthcare professionals in the detection and prevention of malignant melanoma

Few studies have examined the performance of skin assessments by NPs or other healthcare practitioners; further, the paucity of evidence that does exist is not current

and suggests varied practice behaviors. For instance, in a study by Geller et al. (1998), where 756 pediatricians were queried regarding their sun protection counseling practices, a majority of the pediatricians (80%) reported providing routine counseling and education to their patients and families, with sun protection counseling ranking fourth highest among prevention education topics. Whereas, Polster, Lasek, Quinn, and Chren (1998) found that while their sample of 200 patients had been informed about sun exposure risks, only 27% received this information from their dermatologist. The majority of their knowledge had been obtained from media sources. Further, only 34% reported ever receiving a full-body exam from their dermatologist. The majority of the dermatologists in this study estimated that they counseled fewer than 50% of their adult patients about skin cancer risks; this percentage increased if the patient had a history of skin cancer. Weinstock et al. (1999) found that 75% of the 200 respondents to a telephone survey reported having never been asked by a doctor if they perform self skin examinations. Forty-one percent of the respondents reported that their healthcare professional had never performed an examination of their back, and 67% reported never receiving examinations of their calves (the most prevalent sites for malignant melanoma). Robinson, Rigel, and Amonette (1998) found that discussions about sun protection activities with a healthcare professional correlated with the performance of skin self-examinations by patients; even though more subjects reported that they learned about the link between sun exposure and skin cancer from the media rather than by their healthcare professional, delivery of this message by the healthcare professional was the more significant motivator in performing their own skin examinations.

Role of NPs in skin/melanoma assessments

While the literature examining the role of the NP is scant, findings do suggest that NPs are prime candidates for conducting skin assessments. McCaig, Hooker, Sekscenski, and Woodwell (1998) found that NPs perform more patient screenings and provide more counseling services than physicians during wellness exams. Further, NPs believe that providing health education and performing health promotion measures relative to cancer detection and prevention are integral components of advanced practice nursing, and that their abilities in these areas are commensurate to their level of advanced knowledge (Entrekin & McMillan, 1993; McCormick, Masse, Cummings, & Burke, 1999; Tessaro, Herman, Shaw, & Giese, 1996; Warren & Pohl, 1990).

In a pilot study (Oliveria et al., 2001), five NPs with no previous experience in evaluating skin lesions were

recruited to determine their skin cancer screening abilities. Following completion of a skin cancer detection training program that consisted of a workshop, lectures, and a clinical apprenticeship, the NPs performed lesion assessments on a purposive sample of 100 patients with known cancerous lesions. Results suggested that the NPs had greater ability in accurately distinguishing between benign and malignant lesions than detecting specific skin cancer lesions.

Maguire-Eisen and Frost (1994) in their study of 178 NPs, oncology nurses, and dermatology nurses attending a continuing education program designed to increase their knowledge of malignant melanoma found that the dermatology nurses scored significantly higher overall in recognition of lesions, were educating significantly more patients than the NPs or oncology nurses, and performed regular skin cancer assessments. As nurses gained more knowledge about skin cancer and reported greater numbers of clinical experiences, the frequency of conducting skin cancer screenings increased. Despite their advanced education, however, the NPs were less knowledgeable about skin cancer than the nurses working in dermatology and oncology clinical sites.

Clearly, little research has been conducted relative to the adequacy of skin/melanoma assessments performed by healthcare providers including NPs. In addition, the studies reported here were primarily descriptive in design and relied heavily on telephone and mailed survey techniques, thereby creating recall and self-selection bias in the results. Current understanding of the clinical practices of NPs regarding skin/melanoma assessments is not known, nor is it understood if NPs feel prepared to provide this important aspect of patient care. In order to determine if NPs are equipped with the knowledge and skills to adequately screen and counsel patients regarding malignant melanoma and, if not, plan and provide helpful curricula in Advanced Practice Nurse (APN) programs and continuing education courses to better prepare them, more descriptive research is necessary. The use of survey technique, while limited in its descriptive power, does provide a quick and useful measure of potentially large population samples, and a beginning understanding of the phenomenon of interest, and hence, was also used in this study.

Purpose of the study

This descriptive study, which used a survey design and randomization of study participants, had as its purpose to describe the knowledge base and clinical practices and barriers of current NPs within the states of Illinois and California regarding screening and prevention of malignant melanoma. A comparison was desired between these samples because, according to the American Cancer Soci-

ety (2006), Illinois will rank seventh and California will rank highest in estimated new malignant melanoma cases for 2006. In addition, it was believed that climate and geographical differences for each state may reflect a different "sun-worshipping" philosophy among the respective patient populations and possibly different knowledge and practice behaviors among the respective NPs.

Based on the literature review and conceptual framework, research questions for the study were (a) How do Illinois and California NPs differ in their knowledge of risk factors, preventive measures, and recognition of malignant melanoma?, (b) How does knowledge of risk factors, preventive measures, and recognition of malignant melanoma affect frequency of screenings performed by Illinois and California NPs?, (c) How do barriers to performing malignant melanoma screenings differ between Illinois and California NPs?, and (d) What factors influence the development of malignant melanoma screening skills in these two samples of NPs?

Participants

A purposive randomized sample of 100 Illinois and 100 California NPs was obtained through the American Academy of Nurse Practitioners. The inclusion criterion for this study was that the participant be an APN licensed as a certified NP in either Illinois or California. Approval from the authors' Institutional Review Board was obtained. A packet containing the survey, a cover letter, and a self-addressed, stamped return envelope was mailed to the home of each potential participant. Consent to participate was assumed with return of a completed survey.

Data Collection Survey

A minimally modified version of The Malignant Melanoma Prevention and Detection Survey (Maguire-Eisen & Frost, 1994) was used to measure the study variables. The original tool was designed in collaboration with experts in the field of skin cancer research and was used in an initial study that compared malignant melanoma knowledge among NPs and dermatology and oncology nurses. The original tool was reviewed for content validity and readability by experts in the fields of dermatology, oncology, biostatistics, and public health. Test/retest reliability yielded a coefficient of 0.87. For use in this current study, survey items were converted from a slide presentation format to a survey format. The title of the survey was also changed to "The Nurse Practitioner Survey of Dermatological Assessment," per the suggestion of the original author. The modified tool was then reviewed for content validity by two dermatologists and one family nurse practitioner (FNP) practicing in the field of dermatology.

No other content or format changes were made based on this review.

Section I of the questionnaire elicited demographic data and included items which focused on the respondents' specialization, current practice setting and client population, percentage of time performing direct patient care, and type of advanced practice nursing education. In addition, respondents were queried about specific practice behaviors such as how often they perform routine general skin examinations (screening and diagnosing of all types of skin lesions, typically performed by nondermatological NPs) and/or malignant melanoma skin assessments (screening specific for malignant melanoma, typically performed by dermatology NPs) on their patients. Section II, "Prevention Knowledge and Patient Teaching," and section III, "Risk Factor Knowledge and Patient Teaching," evaluated the NP's knowledge of skin cancer prevention measures and risk factors and his/her associated patient teaching practices (Table 1). The "Prevention" section consisted of two subscales: one subscale contained seven true/false items which measured knowl-

edge and another subscale contained seven Likert scale items measuring performance frequency of patient teaching behaviors. Correct responses to the knowledge subscale items were assigned a value of "2" and incorrect responses were assigned a value of "1," with a total possible score of 7–14. Possible responses for the patient teaching items ranged from "never (provides teaching)" which received a value of 1 to "always (provides teaching)" receiving a value of 4; the score range for this subscale was 7–28. For this study, the combined subscales of section I approached an acceptable Cronbach's alpha with a .689.

The "Risk Factor" section also consisted of two subscales: the first subscale contained 12 true/false knowledge items and the second subscale contained 12 Likert scale items that measured performance frequency of patient teaching behaviors. Scoring for these two subscales followed the same pattern as the previous section. Hence, the score range for the "Risk Factor" knowledge subscale ranged from 12 to 24, and the score range for the "Risk Factor" patient teaching subscale ranged from 12 to 48. Cronbach's

Table 1 Sample items of study instruments with reliability results

Instrument	Sample items	Number of items	Cronbach's α
Preventive knowledge and related patient teaching behaviors		14	.689
Preventive knowledge subscale	The avoidance of tanning salons decreases the risk of developing melanoma True False Unsure		
Preventive behavior subscale	How often do you educate your patients regarding the use of sunscreen? Never Occasionally Frequently Always		
Risk factor knowledge and related patient teaching behaviors		24	.878
Risk factor knowledge subscale	The risk factor dysplastic nevus syndrome is associated with an increase risk of melanoma True False Unsure		
Risk factor behavior subscale	How often do you educate your patients regarding the use of a tanning salon? Never Occasionally Frequently Always		

alpha for the combined subscales of the “Risk Factor” section was .878.

Section IV of the instrument, entitled “Barriers,” asked respondents to identify and rank 5 barriers from a list of 10 that they believed best explained why they did not perform patient skin assessments for the detection of melanoma. Space to add additional barriers was provided. Section V, labeled “Identification,” assessed the respondent’s ability to correctly recognize benign and malignant lesions through the use of eight color digitized photos of skin lesions. Correct responses were assigned a value of “2” and incorrect responses were assigned a value of “1”; possible score range for this section was 8–16.

Data analysis

Sample characteristics, scores for malignant melanoma knowledge and related clinical practice behaviors, lesion identification scores, and identification of barriers were analyzed using descriptive statistics. *T*-tests were used to examine differences between Illinois NPs and California NPs on the key study variables. Relationships between age, years of advanced practice, the extent of direct patient care practice, prior experience caring for patients with malignant melanoma, and all survey subscores were examined for significance using the Pearson product moment. The level of significance for this study was set at 0.05.

Results

Sample characteristics

All participants were certified NPs, with FNPs constituting the majority of sample (71%). The overall return rate of surveys was 46.5% ($N = 93$); the individual return rate for Illinois NPs was 46% ($n = 46$) and 47% ($n = 47$) for California NPs. The typical respondent was a Caucasian female, ranging in age between 27 and 62 years and who had worked as an NP full time in primary care clinics serving a mixed client populations, on average of 7 years. See Table 2 for complete sample characteristics.

Knowledge of malignant melanoma

NP knowledge of malignant melanoma was assessed by combining the knowledge items from Section II (Prevention) and section III (Risk Factor) and the lesion identification items from section V; based on these 27 items, the highest possible score, denoting the most knowledge about malignant melanoma, was 54, and the lowest possible score was 27. The mean score for Illinois was 42.69 ($SD = 4.14$), with a score range of 35–50; the mean score for California was 44.25 ($SD = 3.23$), with a score range of 34–52. A *t*-test revealed that the differences in the knowledge

Table 2 Sample characteristics by state

Characteristic	Illinois	California
Age (M, range)	44.29, 27–62	48.79, 27–68
Gender (<i>n</i>)		
Male	1	7
Female	45	47
Ethnicity (<i>n</i>)		
White	42	38
African American	2	1
Hispanic	0	2
Other	1	6
Employment status (<i>n</i>)		
Full time	33	31
Part time	13	15
On leave	0	1
Educational certification (<i>n</i>)		
ANP	16	3
Pediatric nurse practitioner	1	0
FNP	23	43
Other (pediatric, oncology, geriatric, dermatology)	6	1
Primary practice area (<i>n</i>)		
Primary care	18	22
Outpatient/ambulatory care	9	15
Education	1	2
Other	18	8
Employment setting (<i>n</i>)		
Teaching hospital	14	1
Community hospital	6	1
Private practice	2	4
Clinic	16	20
Physician's office	3	2
University	2	13
Other	3	6
Primary client population (<i>n</i>)		
Adults	18	19
Geriatrics	5	0
Pediatrics	2	2
Mixed	21	26
Malignant melanoma education (<i>n</i>)		
Yes	13	18
No	33	29

score means for the two groups was statistically significant ($t = 2.02$, $p = .046$). Frequencies of correct responses for each item by NP sample in the three knowledge subscales are listed in Table 3.

Mean group total knowledge scores were compared by the NP certifications FNPs and adult NPs (ANPs), and “other NPs” (pediatric, oncology, geriatric, and dermatology NPs) represented in this sample using one-way analysis of variance. A significant difference in total knowledge between the groups was noted ($F = 4.176$, $p = .018$). Using Scheffe post-hoc comparisons, the only significant difference between the three groups was found to be between the NP certification group and the “other NPs”

Table 3 Comparison of means for total knowledge score, total patient teaching score, skin assessment behaviors, and direct patient care by state

Variable	Illinois	California	df	<i>t</i>	<i>p</i>
Direct patient care					
<i>M</i>	70.96	85.44			
<i>SD</i>	28.18	20.69	80.77	-2.78	.01
<i>n</i>	45	45			
Patient skin assessment					
<i>M</i>	54.30	38.34			
<i>SD</i>	39.48	32.08	85.79	2.11	.04
<i>n</i>	46	44			
Patient malignant melanoma assessment					
<i>M</i>	32.56	27.92			
<i>SD</i>	39.82	30.60	82.26	.61	.54
<i>n</i>	46	39			
Total knowledge score					
<i>M</i>	31.35	32.26			
<i>SD</i>	3.15	2.41	91	-1.56	.12
<i>n</i>	46	47			
Total patient teaching score					
<i>M</i>	32.91	37.15			
<i>SD</i>	11.09	9.81	91	-1.95	.05
<i>n</i>	46	47			

certifications; the ANPs were significantly more knowledgeable (Table 3).

NP practice behaviors

On an average day, for this total sample of NPs, the mean number of hours per day spent performing direct patient care was 6.2 h. Individually, Illinois NPs spent an average of 5.68 h and California NPs spent 6.8 h, which constituted a statistically significant difference between the two samples ($t = 2.78$, $p = .007$). Analysis of NP practice behaviors revealed a statistically significant difference in group means for the number of routine skin assessments conducted per day ($t = 2.10$, $p = .039$); Illinois NPs performed more general skin assessments per day than did NPs from California ($M = 4.32$ and $M = 3.04$, respectively). No statistically significant difference was noted between the two NP groups regarding frequency of melanoma assessments; however, Illinois NPs did conduct more melanoma assessments per day than did California NPs ($M = 2.64$ and $M = 2.24$, respectively). On average, Illinois NPs reported having cared for an average of 3.93 patients (range 0–100) diagnosed with malignant melanoma, while California NPs cared for an average of 1.51 patients (range 0–15).

Patient teaching by the sampled NPs was assessed by combining the related items from sections II (Prevention) and III (Risk Factors). Possible score range for these 19 items was 19–76. While California NPs more frequently provided patient teaching relative to malignant melanoma prevention strategies and risk factors than did Illinois NPs

($M = 37.14$ and $M = 32.91$, respectively), this difference was not statistically significant.

Pearson product-moment correlations were performed separately by state to examine the relationships between key study variables. In both Illinois and California, as frequency in providing patient teaching about risk factors and prevention measures increased, the frequency of performing malignant melanoma skin assessments also increased ($r = .326$, $p = .027$ and $r = .469$, $p = .003$, respectively). Similarly, in both states, as the frequency of performing general skin assessments increased, the frequency of performing malignant melanoma skin assessments also increased (Illinois: $r = .656$, $p = .000$; California: $r = .582$, $p = .000$).

Barrier-related parameters

Participants were asked to rank order the top five barriers to performing melanoma assessments, choosing 1 as the most significant and 5 as the least significant. Inconsistent completion of this section by a majority of the participants limited the analysis of the variability of responses and the comparison between states. However, frequencies were performed on each barrier to evaluate the most frequently cited barriers. Eighty percent ($n = 37$) of the respondents from Illinois and 60% ($n = 28$) from California identified time limitations as the most significant barrier. The least significant barrier cited for both Illinois and California, (21.7% and 14.9%, respectively) was the statement, "It isn't in my scope of practice" (Table 4). Additional barriers cited by the respondents are listed in Table 6.

Comparisons by demographics

The demographic variables of age, years of practice as an NP, percentage of time the NP performs direct patient care, and NP experience with caring for patients diagnosed with malignant melanoma were analyzed using Pearson product-moment correlations to determine their influence on the practice of malignant melanoma screening skills. No significant relationship was found in this study between the respondent's age and frequency of skin and malignant melanoma exams. For the Illinois NPs, a significant but mild and negative relationship between years of practice and the performance of skin and malignant melanoma exams ($r = -.319$, $n = 44$, $p = .035$ and $-.301$; $n = 44$, $p = .047$, respectively) was noted. In other words, Illinois NPs who had practiced longer performed skin and melanoma screenings less frequently than those who had less practice experience. No significant correlation between these variables was revealed for the California NPs. In evaluating the effect of direct patient care on frequency of skin exams, a significantly positive but mild relationship existed for the Illinois NPs ($r = .291$, $n = 45$, $p = .05$), indicating that as

Table 4 Responses to survey question "barriers to performing a melanoma assessment" by state

Barrier	Illinois	California
	Frequency (%)	Frequency (%)
1. My time is too limited	37 (80.4)	28 (59.6)
2. It would be embarrassing	15 (32.6)	10 (21.3)
3. I don't know what it looks like	12 (26.1)	10 (21.3)
4. There are legal risks	11 (23.9)	12 (25.5)
5. I don't have the skills	22 (47.8)	19 (40.4)
6. It isn't a problem in my patient population	20 (43.5)	15 (31.9)
7. I might miss the melanoma	20 (43.5)	21 (44.7)
8. I don't have an appropriate setting	25 (54.3)	19 (40.4)
9. It isn't in my scope of practice	10 (21.7)	7 (14.9)
10. Melanoma assessments aren't performed in my setting	20 (43.5)	15 (31.9)

a greater percentage of time was expended for providing direct patient care, more skin exams were performed; no similar relationship existed for the California NPs. There was no relationship between direct patient care and frequency of malignant melanoma exams for either state. Patient teaching scores exhibited a moderately positive correlation between age and years of practice for the California NPs ($r = .445$, $n = 47$, $p = .002$ and $r = .369$, $n = 46$, $p = .012$) but not for the Illinois NPs. For the Illinois NPs, a moderately significant correlation was noted between patient teaching scores and knowledge scores ($r = .446$, $n = 46$, $p = .002$).

Discussion

Overall, this sample of NPs demonstrated adequate knowledge about malignant melanoma (average percentile score of 80%) but only performed routine skin assessments and melanoma assessments on their patients 46% and 30% of the time, respectively, and provided patient teaching about malignant melanoma only occasionally (both Illinois and California). Percentile scores for total knowledge were 79% for Illinois and 81% for California. Specific areas of knowledge deficit identified for both states included the prevention measures of using topical retinoic acid and eating a diet high in carotene and the risk factors of having fewer than 30 moles, congenital nevi, and blue/green eyes. Of the eight lesion recognition items, only four were correctly identified by the California NPs and only three by the Illinois NPs. Interestingly, however, the two pictures depicting malignant melanoma lesions were correctly identified by only slightly more than half of the Illinois respondents (54% and 74%, respectively) and the California respondents (64% and 68%, respectively) (Table 5).

Table 5 Correct responses to knowledge of risk factors, preventive measures, and lesion identification

Question number/topic	Correct responses	
	Illinois ($n = 46$)	California ($n = 47$)
Knowledge of risk factors		
30. Having blond or red hair	36	38
32. Use of sunscreen with <#15SPF	29	31
34. Fair/pale complexion	43	46
36. History severe peeling sunburn	36	43
38. Dysplastic nevus syndrome	24	27
40. Skin cancer history	38	42
42. Tendency to develop freckles	28	24
44. Having <30 moles	14	20
46. Congenital nevi	17	15
48. Tanning bed use	37	39
50. Wearing a hat	40	43
52. Blue/green eyes	15	27
Knowledge of preventive measures		
16. Use of topical retinoic acid	18	23
18. Use of sunscreen with >#15SPF	42	41
20. High carotene diet	8	14
22. Tanning bed avoidance	36	37
24. Use of self-action tanning creams	27	27
26. Wearing hat in sun	44	46
28. Limiting sun exposure in children	36	40
Lesion identification		
54. Lesion identification (malignant melanoma)	25	30
55. Lesion identification (seborrheic keratosis)	9	15
56. Lesion identification (seborrheic keratosis)	21	29
57. Lesion identification (benign nevus)	30	32
58. Lesion identification (dysplastic nevus)	9	12
59. Lesion identification (malignant melanoma)	34	32
60. Lesion identification (dysplastic nevus)	9	11
61. Lesion identification (benign nevus)	17	23

California NPs had statistically higher knowledge scores than did Illinois NPs but performed fewer routine skin and melanoma assessments than did the Illinois NPs, despite having greater direct patient care hours per day and in spite of the high incidence of melanoma in their state. Because the survey did not identify specific information regarding the NP's practice, such as the number of patient encounters per day and the complexity of those encounters, it is not possible to determine whether a heavy patient load or high patient acuity could be reasons for not spending time performing skin/melanoma assessments on all patients. Respondents from both states did report, however, that

Table 6 Other barriers and reasons for not performing melanoma assessments on patients

"Patients not educated well enough to bring lesions to my attention"
"I have African American patients"
"Perform prenatal care and need to figure out when such teaching would fit into care"
"Perform limited physical examinations"
"Don't see many of the same patients on a regular basis"
"Appointment wait time is >1 year—have to refer to county hospital"
"Current TB specialty is not related to skin exam for melanoma"
"Refer out immediately"
"Have indigent clients"
"My patients have many, many more immediate serious health risks & I do as much as I can within a limited environment to help them stay alive"

a lack of time in their practice was the greatest barrier for being able to perform skin/melanoma assessments.

ANPs and FNPs demonstrated greater knowledge about malignant melanoma than the NPs represented in the "Other Certifications" classification (i.e., pediatric, oncology, geriatric, and dermatology), with the ANPs demonstrating the greatest knowledge. While this difference may be a function of the small sample size of the "Other" certifications, and/or the focus of care provided by these specific NP specializations, all NPs should be knowledgeable about melanoma and be prepared to provide appropriate assessment and counseling.

According to the PRECEDE–PROCEED model, reinforcing factors, such as continuing education, years of NP practice, educational preparation, and experience with caring for patients diagnosed with melanoma, may influence practice. In this study, the number of years of NP practice was negatively correlated with the performance of skin/melanoma assessments in the Illinois sample and positively correlated with knowledge scores and patient teaching scores in the California sample. While 78.5% ($n = 73$) of the entire sample of NPs had received some formal education about melanoma prevention and detection, 67% ($n = 62$) of the respondents indicated that they had not attended any continuing education programs specific to malignant melanoma. Further, a majority of the respondents (89%, $n = 72$) had cared for fewer than five patients diagnosed with melanoma in the last 2 years, and only 31% ($n = 34$) of the total sample of NPs routinely performed melanoma assessments on more than 50% of their patients. It is possible, therefore, that advanced practice education may not provide enough content about malignant melanoma in order for NPs to feel confident about incorporating specific assessment and patient teaching skills into their practices and that limited practice exposure and continuing education attendance may negatively influence practice behaviors.

Limitations

Findings from this study should be considered with caution. Reliance on participant recall and accuracy of reporting, as well as self-selection, which are inherent components to survey research, greatly limits the confidence in, and generalizability of, study findings. This type of methodology typically provides only superficial data, and provides extensive, rather than intensive, exploration of a phenomenon (Polit & Hungler, 1999). However, survey research can provide the means for reaching a large population and can serve as an initial step in the study of a topic. Other limitations to this study include the small sample size and the use of a newly modified survey instrument. Future research should entail replication of this study using a larger national sample that includes improved representation of nurses from all NP certifications and continued refinement of the instrument.

Implications

Despite the aforementioned limitations, the findings from this study can suggest important research and clinical implications for NPs. To improve the physical assessment skills of NP graduates, NP programs should update their curricula to include not only didactic content about melanoma but also practicum experiences in dermatologic settings. Further, increased awareness for all NPs of the incidence of melanoma and the importance of early diagnosis is needed. The risk of melanoma crosses all age groups and populations; hence, all NPs need information and training regarding identification of melanoma. In addition, continuing education resources with easy user access need to be developed so that practicing NPs can become/remain current with melanoma facts and assessment skills. Quick reference guides/illustrations of melanoma lesions should also be readily available in all NP practice settings. In addition, patient teaching materials should be developed to include self-assessment guidelines and illustrations and recommendations to request annual melanoma assessments from a care provider.

Conclusions

In order to provide effective patient education, perform preventive screenings, and ensure early diagnosis, it is important that all NPs become cognizant of the importance of malignant melanoma screenings, gain competence in their screening skills, and seek ways to overcome barriers to performing screenings in their practice settings.

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