

Improving Nursing Students' Knowledge and Assessment Skills Regarding Skin Cancer Using Online Teaching Resources

Victoria Siegel, Geraldine Moore, and Leeann Siegel

ABSTRACT: Nurses are in an excellent position to teach the public about skin cancer prevention and perform cancer screenings. This study was designed to test an educational intervention intended to teach nursing students about skin cancer so they can reach competence and be certified by faculty to educate their patients. Similarly, students are educated and certified in other areas, namely, asthma and naloxone administration. By conducting this quasi-experimental study, the researchers sought to evaluate the effectiveness of adding online skin cancer education to traditional educational methods. Using a quasi-experimental design, we assigned nursing students ($n = 146$) to either an intervention group, which received an online educational treatment, or a control group, which did not receive any such treatment. Both groups then completed a posttest measure assessing their knowledge about skin cancer ("knowledge"), sun protective behaviors ("behavior"), and perceptions about the role of the nurse in skin cancer prevention ("role"). Participants in the intervention group had significantly higher scores on the "behavior" and "role" measures, suggesting that the intervention had successfully impacted these dimensions.

Victoria Siegel, EdD, RN, CNS, School of Nursing and Health Sciences, Molloy College, Rockville Centre, NY.

Geraldine Moore, EdD, RN, School of Nursing and Health Sciences, Molloy College, Rockville Centre, NY.

Leeann Siegel, MEd, MA, Annenberg School for Communication, University of Pennsylvania, Philadelphia, PA.

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Correspondence concerning this article should be addressed to Victoria Siegel, EdD, RN, CNS, School of Nursing and Health Sciences, Molloy College, 1000 Hempstead Ave., Rockville Centre, NY 11571-5002. E-mail: vsiegel@molloy.edu

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There is a wealth of online educational resources that can enhance nursing education and enable students to learn at home and at their own pace. As nursing faculty, we were interested in examining the use of online resources as additional learning tools. The online resources available for skin cancer are interactive and have exceptional pictorials from which to learn (Informed Skin Cancer Education Series, 2021). We wanted to determine the best methodology to use when teaching about skin cancer.

BACKGROUND

According to the Skin Cancer Foundation, skin cancer is the most common cancer in the United States and worldwide. More than two people die of skin cancer every hour in the United States (Skin Cancer Foundation, 2021). Skin cancer has reached epidemic proportions, and the surgeon general established a call for action in the fight against skin cancer (U.S. Department of Health and Human Services, 2021). Over 5 million people are treated annually for skin cancer. The main types of skin cancer are basal cell carcinoma, squamous cell carcinoma, and melanoma. Basal cell carcinoma rarely metastasizes, but squamous cell carcinoma can metastasize, and melanoma, the deadliest skin cancer, can metastasize very quickly. If melanoma is caught early, there is a 99% chance of survival in 5 years (Skin Cancer Foundation, 2021). Approximately 106,101 melanoma cases will be diagnosed, and about 7,180 people are expected to die from melanoma in 2021 (American Cancer Society, 2021). Therefore, it is very important to teach nurses about skin cancer so they can recognize

the signs and symptoms, educate patients, and refer patients for further evaluation.

Purpose of the Study

The purpose of this study was to test the effectiveness of an intervention designed to strengthen the physical assessment and decision-making skills of nursing students regarding skin cancer lesions and to teach them how to distinguish between benign and cancerous lesions. In addition, the intervention sought to strengthen the students' ability to conduct careful history taking and patient teaching. Because nurses evaluate the skin of all patients admitted to hospitals, they are in an ideal position to educate patients about skin cancer, recognize skin lesions, and refer the patients to the physician for treatment. Therefore, it is necessary to teach these important skills to nursing students.

Significance of the Study

If nurses are knowledgeable about skin cancer, they can assist in reducing the incidence of skin cancer. Nurses are in an excellent position to teach their patients about skin cancer prevention and perform assessments for cancer. Therefore, it is important for nurses to recognize benign and cancerous skin lesions and teach patients about sun safe behaviors (Siegel et al., 2016). This study will enhance nursing students' education and expertise in recognizing skin cancers. This knowledge can assist in saving lives of patients in the community because early detection is essential.

RESEARCH QUESTION

The research question guiding this study was: How do nursing students in the control group and treatment groups compare on posttest measures of their knowledge of skin cancer, sun protective behaviors, and perceptions about the role of the nurse in skin cancer prevention?

LITERATURE REVIEW

Online Education

Research supports combining traditional methods of education with online education to improve learning outcomes. A 2018 study using a two-group posttest experimental design including 60 students showed that the e-learning component of a fundamentals course was a successful educational adjunct for the students (Sheikhaboumasoudi et al., 2018). The researchers found that combining traditional scholarly methods with e-learning had significant results (Sheikhaboumasoudi et al., 2018). Another study examining 372 students' perceived learning outcomes and satisfaction revealed that course design positively affected satisfaction and learning outcomes (Eom & Ashill, 2016). These researchers determined that e-learning contributed positively to motivation, student self-regulation, and satisfaction (Eom & Ashill, 2016). The online educational tool used in the current skin cancer study was interactive, instructive, and well received by students.

Importance of Educating Nursing Students

Nursing practice has always emphasized health promotion, disease prevention, and patient and community advocacy (American Nurses Association, 2020). Patient education is particularly warranted in light of the current skin cancer epidemic. Skin cancer is the only cancer increasing in frequency, and more than 1 million Americans are living with melanoma (National Cancer Institute, 2020). Although melanoma accounts for less than 1% of skin cancer cases, it accounts for most skin cancer deaths. Unprotected ultraviolet light is responsible for 95% of skin cancers (Skin Cancer Foundation, 2020). People are not following sun protective behaviors, and one of three Americans are getting sunburned annually (Centers for Disease Control and Prevention, 2019).

This healthcare problem has become so pervasive that the surgeon general established a call for action against skin cancer in 2014. Nurses across the country assess the skin of all admitted patients, and the main purpose of this assessment is to screen for decubitus ulcers. Expanding this assessment to include teaching patients about sun protective behaviors and screening for skin cancers would serve a greater purpose (Siegel et al., 2016). Therefore, a pilot study was conducted to test the effects of educating and certifying nursing students on skin cancer.

METHODS

The protocol for this study was approved by the institutional review board of two of the authors' college. The students were informed that their participation was voluntary and they could withdraw from the study at any time. The participants consisted of a convenience sample of 146 nursing students enrolled in a senior-level community nursing course at one college. This study used a posttest quasi-experimental and control group design. One class ($n = 34$) was designated as the control group and received only the posttest. The remaining 112 students were designated as the intervention group and received the educational treatment, which consisted of completing the first two cases of an online Informed Skin Cancer Education Series: viewing two online lectures and completing an online American Cancer Society quiz. After this educational treatment, they completed the posttest.

The survey tool used for this study was used in previous studies since 2009 (Siegel, 2009). It was modified slightly for this study and consisted of 31 Likert scale items. The Cronbach alpha's standardized score was .95. The tool was designed by the researcher and used in previous studies.

DATA ANALYSIS

Data analysis was performed in R Version 3.4.3. Before testing any of the hypotheses described above regarding the effects of the intervention on students' knowledge, behavior, and perceptions regarding the role of the nurse, we tested whether the measures used to assess each of these

constructs constituted reliable scales. The Cronbach's alpha for the 10 items included in the knowledge scale was .79 [.73, .84], the Cronbach's alpha for the seven items included in the behavior scale was .71 [.64, .77], and the Cronbach's alpha for the 14 items included in the role of the nurse scale was .90 [.88, .93]. Although the Cronbach's alpha value for the behavior scale was lower than desired, it was still deemed acceptable for this research context (Nunnally, 1978), and our reliability assessment revealed that it would not be improved by dropping any of the items included. We thus proceeded with constructing our knowledge, behavior, and role of the nurse scales. Each of these scales was created by taking the average of all the scores in that category (e.g., the average of all the knowledge items). If a participant was missing one item in a given category, the scale for that category was created by taking the average of the remaining items.

Analysis of variance with covariates was used to determine whether respondents in the intervention and control conditions differed from one another in their scores on the scales used to measure knowledge, behavior, and perceptions regarding the role of the nurse. The covariates included in these models were gender, age, and race.

RESULTS

The mean scores on the knowledge, behavior, and role of the nurse scales for participants in the intervention and control groups are summarized in Table 1. The analysis of covariance results revealed that participants in the intervention and control groups did not significantly differ from one another in their scores on the knowledge scale ($F = 2.09, p = .15$). However, there was a significant difference between intervention group and control group participants in their scores on the behavior scale ($F = 11.48, p < .001$); as can be seen in Table 1, participants in the intervention group tended to have higher scores on this scale. Likewise, intervention group and control group participants differed significantly from one another in their scores on the role of the nurse scale ($F = 29.25, p < .001$); participants in the intervention group had higher scores on this scale as well. None of the covariates included in these models were significant predictors of any of the outcomes tested.

DISCUSSION

As mentioned, skin cancer is an epidemic, and one in five people will get skin cancer in their lifetime. Anyone can get skin cancer. Light-skinned people are more at risk, but people of color have a higher mortality rate than whites

because they tend to disregard a lesion and delay treatment. Melanoma is the leading cause of cancer death in women aged 25–30 years and is second only to breast cancer in women aged 30–34 years (Skin Cancer Foundation, 2020). Tanning beds are deadly, and they have been deemed carcinogenic by the World Health Organization and have been outlawed in Australia (World Health Organization, 2017). One increases their risk of melanoma by 76% because of tanning beds in the 18- to 26-year age group.

Nurses comprise the largest number of healthcare workers in the country. There are 4 million Registered Nurses in the United States, with 85% employed in nursing (U.S. Bureau of Labor Statistics, 2019). Nurses could play a crucial role in reducing morbidity and mortality by educating the public and assessing for skin cancers. Results from this study suggest that an intervention composed of online educational tools could help nurses more effectively carry out this role by impacting their own sun protective behaviors as well as their perceptions about the roles that nurses should play in helping to educate patients about and address skin cancer. Although the intervention was not found to have a significant impact on nurses' knowledge, this null result may be explained by the small sample size of the study, a limitation discussed below. Overall, this study's results indicate that this online educational intervention could be a promising addition to nursing students' training. Given that all the materials that comprised the intervention are online, this intervention could be easily replicated in other nursing schools across the country. More broadly, this study's findings add to the growing body of literature (e.g., Sheikhaboumasoudi et al., 2018) showing the promise of e-learning and online educational tools in improving nursing education.

LIMITATIONS

The main limitation of this study was its small sample size ($n = 146$). Because this was only intended as a pilot study, there were relatively few participants, and this may have contributed to the null effects found for one of our outcome variables, knowledge. In addition, the study only included participants at one college, and therefore, findings may not be generalizable to other colleges that differ in substantial ways. Future research should test the effectiveness of the intervention using a larger pool of participants from multiple nursing programs.

CONCLUSION

The researchers were able to determine that educating and certifying nursing students enabled them to have more confidence in their abilities and made them more adept at educating their patients. The nursing students were encouraged to assess and educate all patients as this is an important healthcare initiative set forth by the Surgeon General and the recent resolution by the National Student Nurses' Association. The ultimate goal is that all patients will be assessed and received education about skin cancer and sun protective

TABLE 1. Scores for Each Scale by Condition: Mean (Standard Deviation)

	Knowledge	Behavior	Role
Intervention group	4.49 (0.44)	4.59 (0.41)	4.61 (0.44)
Control group	4.37 (0.75)	4.29 (0.71)	4.06 (0.76)

behaviors. This skin cancer educational program could be a model for other colleges to follow. More education is needed to assist nursing students in distinguishing between lesions. This knowledge can assist in saving lives of patients in the community. ■

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