



## Original Research

# Video education to improve recognition of common benign and malignant cutaneous lesions and skin cancer prevention in the public<sup>☆</sup>



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## ABSTRACT

**Objective:** Although dermatologists strive to provide patient education on sun protection and skin cancer, approximately 90% of Americans have limited health literacy skills. Little has been written about the means to best teach all levels of learners to recognize common benign and malignant skin lesions. Earlier work found that with advancing age, adults were less able to identify concerning lesions, thus underscoring the need for accessible education.

**Methods:** We showed subjects a brief video (7th grade level) about common cutaneous growths, reducing the risk of skin cancer, and the importance of early detection. Subjects were asked about their skin cancer history, educational format preference, and the perceived impact of the video. Comprehension of symptoms of skin cancer and the benefits of sunscreen use and the ability to identify a melanoma, nevus, angioma, and seborrheic keratosis were also assessed.

**Results:** Of the 156 subjects, mean age 52.7 years (range, 18–88 years), 31% had a history of skin cancer. A total of 98.7% found the video to be helpful; 92% preferred having a video as part of their teaching versus 9% who preferred written materials alone, 99% knew that a new or changing lesion could signal skin cancer, and 100% correctly answered that wearing sunscreen is protective. Subjects correctly identified lesions as melanoma (99%), benign mole (97%), angiomas (96%), and seborrheic keratosis (91%). There was a nominal trend toward higher scores in people who preferred video learning, had no history of skin cancer, and were older than 60 years of age.

**Conclusion:** In this study, we found that a brief, plain-language video was effective at conveying understandable content to help subjects learn to identify common cancerous and benign skin growths while also teaching them strategies to protect against skin cancer.

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## Introduction

Despite numerous ongoing sun protection campaigns, 1 in 5 Americans will still develop skin cancer during their lifetime (Rigel et al., 1996). Although dermatologists may feel that they are adequately educating their patients on the identification of common

harmful and harmless skin lesions, recent work has shown that there is a gap in knowledge with regard to patients' ability to recognize benign and malignant skin lesions, a trend that worsens with patient age (Lee et al., 2017). Notably, this discrepancy is evident even in patients with a history of skin cancer who routinely undergo skin checks with a dermatologist.

This finding may appear surprising because informational pamphlets or other written materials are frequently handed out at dermatology clinic visits to supplement verbal counseling. However, this gap is less surprising when we consider that 90% of Americans have limited health literacy skills (America's Health Literacy: Why We

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Need Accessible Health Information, 2008). Audiovisual presentation of salient health information has been proposed as an effective method to bridge this gap because electronic media are already entrenched in modern society (Armstrong et al., 2010; Love et al., 2016). In this study, we evaluated the effectiveness of a brief, simply worded video to teach subjects about skin lesions and skin cancer.

## Methods

A 2-minute video entitled *Know Your Skin* (scripted at the 7th grade level) was developed and filmed (see Supplementary video 1). Topics presented included common benign and malignant cutaneous growths, methods to reduce the risk of skin cancer, the importance of early skin cancer detection, and seeking medical evaluation when appropriate. The word rate was slow, and the upper portion of the video was overlaid with captioning to highlight important features. Speakers in the video were male and female and of diverse ethnicities to reinforce the message that anyone can get skin cancer. Because dermatologic terminology can be daunting for the layperson, common benign and malignant skin lesions were described in plain, simple language, and an accompanying image was provided for each. Instruction on the features of skin cancer, providing reassurance about benign skin lesions, and empowering subjects to take preventative steps to minimize their risk of getting skin cancer were the main educational goals of the video.

This video was shown to consecutive consenting adult subjects at an outpatient dermatology clinic. After watching the video, participants completed a short quiz to assess their comprehension. The quiz asked them to confirm the symptoms of skin cancer, describe the role of sunscreen in skin cancer reduction; and identify common skin lesions, including melanoma, nevus, angioma, and seborrheic keratosis. The total possible score was 6, and each correct answer was worth one point. After the video and quiz, participants were also asked whether the video helped them distinguish between common benign and cancerous skin growths as well as which learning method they preferred (i.e., video, written, or both). The demographic information collected included age and whether or not participants had a personal history of skin cancer.

Statistical analysis (SAS, Version 9.4m4, SAS Institute Inc., Cary, NC) was performed to assess the relationship, if any, between higher quiz scores and age over or under 60 years, preference for video learning, and personal history of skin cancer. All data were analyzed with unpaired *t* tests. When the data did not follow a normal distribution, the Wilcoxon Rank Sum test was performed instead. Descriptive data are also provided.

## Results

A total of 156 male and female subjects, mean age 52.7 years (median: 54; range, 18–88 years) were surveyed. Personal history of skin cancer was reported by 31% of participants.

After watching the video, 99% knew that a new, bleeding, changing lesion could be a sign of skin cancer, and 100% correctly answered that wearing sunscreen can reduce chances of getting skin cancer. Subjects correctly identified lesions as melanoma (99%), benign mole (97%), angioma (96%), and seborrheic keratosis (91%).

There was a nominal trend (Table 1), but no significant difference, toward higher scores in subjects who preferred video learning ( $p = .24$ ). Participants who did not have a history of skin cancer ( $p = .91$ ) also tended to have higher scores, as did patients who were older than 60 years of age ( $p = .27$ ). A total of 98.7% of participants found the video to be a helpful learning tool, and 92% preferred having video as part of their teaching. Nine percent of participants preferred written materials alone.

**Table 1**  
Comparisons of the mean of total scores

Study Category	No.	%	Score (Total)			
			Mean	SD	<i>p</i> -value	
<b>Age Breakdown*</b>	<60	96	61.93	5.77	0.51	.2748
	≥60	59	38.06	5.86	0.39	
<b>Previous History of Skin Cancer</b>	Yes	48	30.77	5.79	0.5	.9110
	No	108	69.23	5.81	0.46	
<b>Preference of Teaching Materials</b>	Video	83	53.21	5.82	0.47	.2428
	Both	59	37.82			
	Written	14	8.97	5.71	0.47	
<b>Felt Video was Helpful</b>	Yes	154	98.72	5.81	0.47	.2957
	No	2	1.28	5.5	0.71	

SD, standard deviation.

\* Age data collected from 155/156 subjects.

## Discussion

The primary findings of this study were that after viewing a brief and simply worded video module, the majority of participants successfully learned basic information about skin cancer prevention and developed some ability to distinguish between common benign and malignant skin lesions. After viewing the video, the subjects had an excellent ability to identify both normal, noncancerous (e.g., nevus, angioma, and seborrheic keratosis) and harmful, cancerous (e.g., melanoma) tumors. Specifically, after watching the video, participants were aware of sentinel features (e.g., new lesion, change in an existing lesion, or a bleeding lesion) that can signal skin cancer. Similarly, all participants expressed knowledge that regular sunscreen application can reduce the risk of developing skin cancer. While administering the quiz right after the video module may have resulted in more correct responses than would have otherwise been observed, this was compatible with clinic flow and reduced the likelihood of loss to follow-up.

Reassuringly, the video, which was specifically created to educate learners of all levels, was in fact equally successful at educating all subgroups studied, including those above and below 60 years of age, those with and without a history of skin cancer, and those who preferred video education versus those who did not. These educational outcomes are particularly encouraging because awareness of the basics of skin cancer may motivate patients to practice good sun safety habits and to more promptly self-identify suspicious lesions for evaluation by a dermatologist.

Limitations of this study include that subjects were not educated on a wide range of cutaneous lesions. We instead focused on commonly encountered skin diagnoses to ensure that patients were not overwhelmed with information. Additionally, we did not survey patients before and after viewing the video in an effort to be respectful of their time. All subjects were adults who were able to provide consent, but for the sake of simplicity in this pilot study, additional demographic data such as income level and years of education were not collected. Finally, although we did not have a comparison group or internal control that received standard written information only, we do believe earlier work (Lee et al., 2017) showed that such instruction was often insufficient to help patients distinguish between benign and malignant lesions.

As U.S. health care costs continue to increase, it is critical to find ways to prevent disease while reducing utilization (Rigel et al., 1996). Because skin cancer is the most common form of cancer in the United States, dermatologists play a crucial role in educating the public on prevention and early recognition to reduce the associated morbidity and mortality (Key Statistics for Basal and Squamous Cell Skin Cancers, 2016; Rigel et al., 1996). Progress has been made toward enhancing patient understanding and improving cutaneous health awareness. However, a disconnect remains between what

**Table 2**

Suggestions for communicating actionable health-related content

Keep paragraphs and sentences short and simple (<20-word sentences)
Always use language that is familiar to your users
Use the active voice
Define complex terms
Use a friendly, conversational tone (avoid formal language)
Put the most important information first
Create user-friendly quizzes

Source: Health Literacy Online – health.gov.

physicians want patients to know and what patients leave the office remembering. The challenge stems from the fact that 90% of the population has limited health literacy skills (*America's Health Literacy: Why We Need Accessible Health Information*, 2008). Data from the U.S. Department of Health and Human Services (HHS) National Assessment of Adult Literacy show that health literacy is an issue for all racial and ethnic groups, particularly the elderly. The HHS survey further reveals the public's reliance on nonprint materials as important sources of health information.

In response to the growing need for a better mode of communication, the HHS recommends strategies for professionals to consider with the goal of developing universally accessible information. Approaches should be consistent with user propensities as well as literacy constraints (*America's Health Literacy: Why We Need Accessible Health Information*, 2008). Adoption of these educational initiatives can be simplified by the current ubiquity of electronic resources and audiovisual communication. Indeed, this has been the inspiration behind turning to video education as an effective modality for the presentation of concise, easily understandable patient information to fill the gap between currently delivered and understood health information (Trinh et al., 2014).

Although little has been written about how to best teach all learners self-recognition of common benign and malignant skin lesions, multiple studies have shown the effectiveness of video education to relay health information (Armstrong et al., 2010; Lee et al., 2017; Trinh et al., 2014). Previous studies have shown the low efficacy of traditional skin cancer education via written and spoken instruction, particularly in the aging population, which has low levels of health literacy (Armstrong et al., 2011; Lee et al., 2017). These issues may be attributed to reading and cognitive limitations, which are exacerbated by the brevity of clinic visits and inconsistent oral instruction.

In line with these findings, further guidelines for the development of easily comprehensible digital tools and health websites have been developed by the Office of Disease Prevention and Health Promotion (ODPHP). These emphasize the importance of plain language and engaging the listener, characteristics that were incorporated in our short, captioned video (*Health Literacy Online - health.gov*, 2016). Specific targeted strategies to improve effective understanding while using digital tools (Table 2) include identifying viewer motivations and goals, providing specific action steps, using everyday examples to explain medical or technical concepts, and grouping

information into meaningful categories to ensure adequate continuity of information.

In keeping with the recommendations provided by the ODPHP, our study results indicate that a brief, captioned video scripted at an elementary school level can be an effective method for patient instruction. These findings are consistent with prior work that has shown a benefit to video-based delivery (Love et al., 2016; Roman et al., 2016; Van Acker and Kuriata, 2014).

## Conclusions

This study shows that video-based education can be an effective tool for teaching basic dermatologic concepts to patients and may help close the current gap in knowledge regarding self-screening for malignant skin lesions. Unlike earlier studies, which found no such relationship, we found that older age and a history of skin cancer conferred a nominally better understanding of skin cancer risk. This was not a marked, statistically significant finding, which further confirms the importance of reiterating concerning signs and symptoms of skin cancer at every clinic visit, even for those patients who may be expected to have prior knowledge. Video education in dermatology clinics, when geared appropriately to the needs and preferences of all levels of learners, can provide an easy, appealing, broadly applicable alternative to traditional paper and verbal instruction.

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ijwd.2017.10.005>.

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