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Original Research

A pilot study examining skin cancer education in an underserved population at a free skin cancer screening

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ABSTRACT

Background: Minority populations are increasingly diagnosed with skin cancer and often in later stages with more aggressive subtypes.**Objective:** We sought to pilot a study to evaluate the effectiveness of providing a skin cancer screening and education module to address potential barriers to dermatologic care for an underserved population in New Haven, Connecticut.**Methods:** At a free clinic, voluntary adults (n = 24) waiting for a skin cancer screening were recruited and consented to participate. Participants completed a 16-question survey prior to the total body-skin examination and the educational module, as well as a survey after the examination.**Results:** Most participants were uninsured (79%) and Hispanic (71%). Pre- and postintervention surveys indicated significant increases in knowledge, risk awareness, and confidence for self-screening.**Conclusion:** This study establishes an effective public health education intervention to promote the prevention of skin cancer. A multicenter study with a larger sample size and longer follow-up period to assess knowledge retention could further address limitations in this initial pilot study.© 2020 Published by Elsevier Inc. on behalf of Women's Dermatologic Society. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

The diagnosis of skin cancer is steadily increasing in the United States each year in minority populations (Chung et al., 2015; Garnett et al., 2016; Harvey, 2018). Outcomes are often worse in these populations due to late-stage presentation and more aggressive histologic subtypes (Garnett et al., 2016; Harvey, 2018; Tsai et al., 2018). The delay in skin cancer detection and treatment in minority populations has previously been attributed to barriers such as patients' lack of understanding about skin cancer, lower rates of self- and physician-performed skin examinations, limited access to dermatologic care, and other socioeconomic factors (e.g., health insurance; Hernandez et al., 2013; Ortiz et al., 2005; Tsai et al., 2018). Given the high number of uninsured minority patients in New Haven, Connecticut, and their limited options for dermatologic care, we sought to pilot a study to evaluate the effectiveness of providing a skin cancer screening and education mod-

ule to address potential barriers to dermatologic care for this underserved population.

Methods

The Institutional Review Board of Yale University approved this study. At a free clinic in New Haven, Connecticut, adults (n = 24) waiting for a voluntary skin cancer screening were recruited and consented to participate. The inclusion criteria were age ≥18 years and residency in New Haven. All materials were available in English or Spanish.

Participants were asked to complete a 16-question survey prior to the total body skin examination and the educational module. The questions on this survey were adapted from the validated questionnaire assessing participants' skin cancer risk, self-examination knowledge, and demographic characteristics (Chung et al., 2015). After the survey, patients had a dermatologist-led total body skin examination. Immediately afterward, medical students gave 15-minute information modules using handouts published by the American Academy of Dermatology (AAD). The

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module consisted of identifying common skin cancer risk factors, describing the ABCDE rule (asymmetry, border irregularity, color, diameter, and evolving) for melanoma surveillance, understanding the importance of sun protection, and reviewing steps for a self-skin examination. After the educational module, participants were given a survey adapted from the Skin Examination Questionnaire (Chung et al., 2015; Tsai et al., 2018) that assessed their knowledge of skin cancer risks and self-skin examinations, as well as perceived barriers to dermatologic care.

Using SPSS, version 25 (IBM, Armonk, NY) and STATA, version 13 (StataCorp LP, College Station, TX), demographic information was analyzed and patient knowledge levels were compared between the pre- and post-intervention surveys using the paired McNemar's exact test to determine the effect of the educational intervention.

Results

Demographic characteristics of the participants are listed in Table 1. The majority of participants were uninsured (79%) and Hispanic (71%; Table 1). The most common reason for attending the screening was lack of access to a dermatologist (75%; n = 18) and the most frequent barrier to seeking dermatologic care was lack of health insurance (79%; n = 19). Notably, analysis of participants' responses to pre- and post-intervention surveys indicate significant increases in knowledge, risk awareness, and confidence for self-screening (Table 2).

Discussion

Racial and ethnic disparities in skin cancer exist, as evidenced by late-stage skin cancer detection and poor outcomes in minority populations (Garnett et al., 2016; Harvey, 2018; Tsai et al., 2018).

Table 1
Demographic characteristics.

Characteristic	Value n = 24
Total	
Age, y	
Mean (standard deviation)	45.2 (18.0)
Median (range)	47 (18–72)
Sex, n (%)	
Male	9 (38)
Female	15 (62)
Ethnicity, n (%)	
Hispanic	17 (71)
Other or Declined	7 (29)
Race, n (%)	
Multiracial	14 (58)
White	5 (20)
Black	4 (17)
Asian/Pacific Islander	1 (4)
Insurance status, n (%)	
Uninsured	19 (79)
Public insurance	2 (8)
Private insurance	3 (13)
Reasons for attending screening, n (%)	
No access to dermatologist	18 (75)
Concerning skin lesion	10 (42)
Publicity	3 (13)
Family history of skin cancer	1 (4)
Perceived barriers to care, n (%)	
Lack of insurance	19 (79)
Cost	11 (46)
No primary care provider	5 (21)
Lack of knowledge about skin cancer	2 (8)
Language	1 (4)
Transportation	1 (4)

Table 2
Self-reported patient knowledge on skin cancer before and after intervention.

Question	Pre-intervention survey, n (%)	Post-intervention survey, n (%)	p-value
How much do you know about skin cancer?			<.0001
A lot	0 (0.0)	10 (40.0)	
Somewhat	12 (48.0)	14 (56.0)	
Not at all	12 (48.0)	0 (0.0)	
How confident are you that you know how to examine a mole for asymmetrical shape, unusual color, or size?			<.0001
A lot	1 (4.0)	13 (52.0)	
Somewhat	9 (36.0)	10 (40.0)	
Not at all	14 (56.0)	0 (0.0)	
I am well aware of what may cause skin cancer and how to prevent it.			.0001
Yes	10 (40.0)	23 (92.0)	
No	10 (40.0)	0 (0.0)	
Unsure	4 (16.0)	0 (0.0)	
I know how to check my skin for skin cancer.			<.0001
Yes	0 (0.0)	24 (96.0)	
No	18 (72.0)	0 (0.0)	
Unsure	6 (25.0)	0 (0.0)	
I know what the ABCDE rule is and what each letter stands for in screening for melanoma.			<.0001
Yes	1 (4.0)	23 (92.0)	
No	19 (76.0)	1 (4.0)	
Unsure	4 (16.0)	0 (0.0)	

ABCDE, asymmetry, border irregularity, color, diameter, and evolving.

These disparities can be mitigated by increasing minority patients' knowledge of skin cancer prevention strategies. This study establishes an effective public health education intervention to promote skin cancer prevention that increases participants' knowledge about skin cancer risk factors and self-screening in a minority population. Additionally, this novel point of engagement with underserved patients and allowed us to assess barriers to dermatologic care.

Despite the presence of resident clinics, a medical student free clinic, and a community health center in New Haven, a concerning proportion of participants identified lack of access to dermatologic care as an issue, highlighting the importance of free screenings and health education interventions in this underinsured minority population. As demonstrated by our study, free skin cancer screenings are an ideal setting to implement prevention efforts, which can be bolstered after the screening event by AAD's educational materials and online resources for patients.

Although free screenings, particularly the large number conducted through AAD's SPOT me program, may provide a one-time means for these patients to undergo a skin check, the lack of access to care noted by the individuals in our screening suggests that alternative options to offer regular visits would be of benefit to these communities (Okhovat et al., 2018). Student-run free clinics, such as the one with which we partnered for our study, have become increasingly common in medical schools across the country and have become an important part of the safety net for underserved patients in the community (Simpson and Long, 2007; Smith et al., 2014). These clinics have also become points of contact to connect uninsured patients with specialty care (Smith et al., 2014.) This is especially important given that previous studies have demonstrated that lack of insurance is a reason for noncompliance with follow-up care after skin cancer screenings (Bolognia et al., 1990). Partnering with the medical student free clinic allowed us

to ensure that all attendees would be able to receive follow-up care, either through personal insurance or through the free clinic's referral program. In communities without academic medical centers, other forms of free clinics may offer an alternative approach (Darnell, 2010).

Limitations of this study include the small sample size, which precludes generalization of these findings. The short time interval between the pre- and postintervention surveys also prevented us from measuring the knowledge retention of participants. A follow-up multicenter study with a larger sample size and longer follow-up period to assess retention could address many of the limitations found in this pilot study.

Conclusion

Brief educational modules, such as the one used in this study, can be easily incorporated into skin cancer screenings and offer the opportunity for dermatologists to address the needs of underserved communities.

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Study Approval

The author(s) confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies.

Declaration of Competing Interest

None.

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