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An educational intervention to improve human papilloma virus (HPV) and cervical cancer knowledge among African American college students☆

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HIGHLIGHTS

- Educational interventions improve knowledge about HPV and cervical cancer.
- HPV Vaccine and Pap test screening awareness increases with targeted education.
- HPV related educational outreach programs for college students is feasible.

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ABSTRACT

Objectives. Misinformation and lack of formal education about cervical cancer may contribute to disparities. The objective of this study was to assess the role of an educational intervention in improving knowledge about Human papilloma virus (HPV) and cervical cancer among African American female college students.

Methods. We completed a total of 5 lectures at 4 different historically Black Colleges in North Carolina, Virginia, and West Virginia. Each 60 min lecture reviewed basic female anatomy, HPV pathogenesis, cervical dysplasia, cervical cancer, HPV vaccination and cervical cancer screening. Participants completed pre- and post-lecture surveys assessing knowledge, attitudes and beliefs related to cervical cancer screening, HPV, and the HPV vaccine.

Results. A total of 72 students attended the lectures and 57 students completed the surveys. 96% of students reported knowledge of the HPV vaccine, however only 52% reported receiving the vaccine, and 42% completed the 3-shot series. About 77% of students over 21 years of age reported having a Pap smear. Of the 16 knowledge-based questions, correct response rates significantly increased (74% v. 91%, $p = 0.005$) with the intervention. At the completion of the intervention, 94% affirmed plans to get regular Pap smears and 87% affirmed plans to get the HPV vaccine.

Conclusions. Primary prevention and early detection are key interventions for reducing disparities in cervical cancer incidence and treatment. Community outreach efforts play an important role in reducing inequities in cancer among high-risk groups. The educational intervention utilized in this study was successful in improving knowledge about HPV and cervical cancer.

1. Introduction

Cervical cancer has long been recognized as a disease that disproportionately affects racial and ethnic minorities. While today the overall incidence in the United States is low, Hispanic and African American women bear a disproportionately large burden of the disease [1]. In recent years, increased attention has been placed on addressing the overwhelming disparities seen in cervical cancer. In the last decade, rates have actually dropped faster among African American than White women. Despite this trajectory, according to the American Cancer Society's 2017 report of Cancer Facts and Figures, the incidence of cervical cancer is still 9.8 per 100,000 in African American women, compared to 7.0 per 100,000 in White women, a nearly 40% difference [2]. Similarly, African American women are persistently more likely than any other group to die from cervical cancer. Death rates for African American

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women are 3.8 per 100,000, compared to 2.1 for White Women and 2.3 for all races combined [3].

The overall 5-year relative survival rate for cervical cancer among African American women is 57%, compared to 69% among White women [2]. African American women are more likely to be diagnosed with advanced stage disease [4] despite similar screening rates reported in national surveys [5]. Racial differences in stage at diagnosis could potentially be due to differences in the quality of screening and follow-up after abnormal results [6,7,8]. Perhaps more telling is data from the National Cancer Database that revealed that only 53% of African American women receive guideline based care in locally advanced cervical cancer [9]. African American women are less likely to receive radical hysterectomy for early-stage cervical cancer compared to White women [10], and are less likely to receive intra-cavitary radiation for locally-advanced disease [11].

The ongoing existence of socioeconomic, educational, and health system barriers continue to impact access and utilization of quality health care. While these more complex social issues may take decades or even centuries to overcome, misinformation and lack of formal education are key factors that also contribute to disparities, and whose remedies are indeed within reach. Focus group interviews with African American women in Boston, Massachusetts revealed that inadequate information and education of providers and patients created barriers to appropriate screening and treatment practices for African American women [12]. Several other studies have demonstrated similar findings with African American women consistently demonstrating less awareness of the HPV vaccine and early detection for cervical cancer [13,14,15]. However, there is otherwise scant data regarding the best approach.

Educational interventions to improve knowledge and attitudes have already demonstrated effectiveness in the Hispanic community. Mexican-American women were one of the first groups that benefited from a targeted educational intervention following this recommendation. The CDC funded a randomized controlled trial that looked at an educational intervention among Mexican-American women, called AMIGAS, that included a video of Hispanic women discussing the benefits of the Pap test and some of the barriers they face, as well as an illustrated document that presented information about cervical cancer and the Pap test [16]. 29% of women in the control group compared to 62% in the full AMIGAS program group reported having had Pap test, concluding that this AMIGAS program was effective in increasing Pap screening in this population.

To expand on the above work, we used a similar interactive model in a young female African American community. Our aim was to assess whether an educational intervention aimed towards college aged African American women is beneficial in increasing knowledge about HPV and cervical cancer. The concurrent goal was to increase community awareness about cervical cancer prevention.

2. Methods

2.1. Study participants

For this project, we sought African American female students at Historically Black Colleges and Universities (HBCUs) in the Southeast United States. We focused on HBCUs as intervention sites for ease of assembling our intended audience. This particular age group was selected because of the unique time frame, including eligibility for HPV vaccination, while at the same time approaching (if not already reached) the initiation age for Pap smear screening. We completed 5 interventions at 4 different Universities. We completed 2 interventions at Hampton University in Hampton, Virginia, 1 at Marshall University in Huntington West Virginia, 1 at West Virginia State University in Charleston West Virginia and 1 at North Carolina Central University in Durham, North Carolina. Hampton University (91% African American student body), home to 4600 students, was founded in 1868 and is home of Emancipation Oak, the site of the first Southern reading of the Emancipation Proclamation [17]. West Virginia State University was founded in 1891 to educate African American students in the state of West Virginia, and is currently home to 3500 students [18]. It is currently one of the only HBCU campuses in the US where African American students are a minority (10%), due to demographic changes in the state of West Virginia, as well as active efforts to racially integrate the school in the 1980s and 1990s. North Carolina Central University (78% African American) was founded in 1910 and currently has 8100 students enrolled [19]. Of the 4 Universities visited, Marshall University, founded in 1837 is the sole historically majority White school that we visited (6% African American population); and for this intervention, we reached out to their Black United Students Group [20].

2.2. Intervention

Our intervention was developed through the collaborative efforts of the primary authors and updated as needed. All expenses related to travel, advertisement, and intervention employment were funded by the primary authors as well. The final program was packaged as a 1-hour lecture which included a Power Point presentation, female body diagrams, and topic-specific medical instruments, including plastic speculums and Pap brushes. The concentration of our intervention was the Power Point presentation, determined by the authors to be age-appropriate and culturally relevant. A young African American female caricature was created through Bitmoji [21] and her depiction was scattered throughout the slides to serve as a comical narrator and navigator to introduce and help explain the different topics. The program was delivered by a senior OB/GYN resident at Cedars-Sinai Medical Center, who is also of African American background. Topics that were reviewed in the intervention included 1) Basic female anatomy, 2) Normal cervical function, 3) Common cervical pathologies, 4) Cervical dysplasia, 5) Cervical cancer, 6) HPV, 7) Disparities in cervical cancer, 8) Pap smear, and 9) HPV vaccination. We utilized body diagrams for better understanding of basic anatomy and normal cervical function. Plastic speculums and Pap brushes were passed out to the students to understand, for example something as simple as the difference between a speculum exam and a Pap smear. We created illustrations on the white boards to supplement their learning. The presentation included key statistics about cervical cancer, specifically describing the disproportionate incidence and mortality rates facing African American women. We employed interactive questioning throughout the intervention to ensure comprehension. Learning objectives of the intervention were 1) Cervical cancer is caused by HPV, 2) Black women are disproportionately affected, and 3) Cervical cancer is preventable. The primary endpoint was knowledge assessment as ascertained by pre- and post-lecture surveys.

2.3. Analysis

Prior to the intervention the students responded to a pre-lecture survey about Pap test history, HPV vaccination status, knowledge about cervical cancer and HPV, and attitudes and beliefs about screening. The pre-lecture survey consisted of 29 total questions, including 16 knowledge-based questions, 4 demographics questions, and 9 regarding personal history and attitudes. Following the intervention, participants were asked to complete a follow-up survey. The post-lecture survey included the same 16 knowledge-based questions as well as 2 questions to elicit a change in attitude about Pap smears and the HPV vaccine following our lecture. 15 of the knowledge-based questions were True or False, and 1 was multiple-choice.

The rate of correct response for each survey was computed as a percentage. Total score was computed as the percent of correct answers. Correct response rates for the Pre-Test were compared to that of the Post-Test. *P*-values were computed by Paired t-Test for the total score.