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# The Use of the Ethno-Drama Experience to Increase Knowledge and Promote Cervical Cancer Health Related Behavior among People of Color

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## Abstract

Cervical cancer is a significant health disparity in the U.S. and is the second most common cancer in women worldwide [1]. African American women have higher mortality rates from cervical cancer compared to non-Hispanic white women [2]. There have been several interventions and prevention strategies implemented to educate women about cervical cancer. In previous studies, theater use has been used to address health disparities, increase knowledge, and has found significant increases in pro-social related health behaviors i.e., screening, treatment, vaccines [3]. The current study sought to evaluate the use of theater and a health educate panel as an intervention to increase knowledge, awareness, and pro-social health behaviors related to cervical cancer among participants in the surrounding communities. A standard pre/post-test design identified 101 participants in the ethno-drama experience about cervical cancer. The results of the data indicated that the ethno-drama intervention was effective in increasing cervical cancer health related behaviors.

## Keywords

Cervical cancer, People of color, Theatre

## Introduction

Cervical cancer is the fourth most common life-threatening cancer among women across the world [4]. According to the National Institutes of Health (NIH), the prevalence of women living in the United States with cervical cancer in 2015 was estimated at 257,524 women. The National Cancer Institute estimated approximately 13,240 new cases of cervical cancer and 4,170 deaths for 2018. Cervical cancer is prevalent more in Hispanics and Black women [5]. However, African American women have the highest mortality rates due to late-stage diagnosis and less access to care [6].

Cancer of the cervix, also known as cervical cancer, starts in the cell lining of the cervix. Also known as the uterine cervix, it connects the body of the uterus to the vagina. The cervix is made up of two parts; one part is the endocervix, which is closest to the body of the uterus and covered with epithelial cells. The other part that makes up the cervix is the ectocervix, which is next to the vagina and covered in squamous cells [7]. Cervical cancer is most frequently diagnosed in women between the ages of 35 and 44 [8].

Over 20% of cases are found in women over the age of 65 [9]. About 50% of women diagnosed with cervical cancer have never been screened. To be tested, a woman must be 21-years-old and should be advised to continue screening after the age of 65 [10]. Screening for cervical cancer is done by cytological examination of cells by using a panicolaou smear (pap smear), which detects the Human papillomavirus (HPV), which has been found to contribute to cervical cancer. Other factors that may contribute to cervical cancer are nutrition, sexually transmitted disease, cigarettes, vaginal douching, and the use of oral contraceptives [11].

Treatment for cervical cancer can range from less than $400 to $11,000 or more depending on the phase of the cancerous cells and amount of procedures required [12]. The underlying cost of screening, procedures, and treatment may contribute to the mortality rate of African American. The estimated annual direct medical cost of preventing and treating HPV-associated diseases was estimated to be $8.0

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billion [13].

An estimated $6.6 billion (82.3%) was for routine cervical cancer screening, and follow-up, $0.4 billion for cervical cancer, and $0.3 billion (3.6%) was for genital warts [13]. As noted, cervical cancer is the third most common gynecological cancer among women [6]. African American, Hispanic, American Indian, and Alaskan Native women are disproportionately affected by cervical cancer compared to white women [6]. In the United States, 13,000 new cervical cancer cases are diagnosed each year, and more than 4,000 women die from it [6].

In previous studies, the use of theater has been used to increase knowledge and change behavior regarding health disparities [14]. Many of these studies have employed standard pre-post designs. These designs have provided the audience with question and answer sessions and/or panel discussions about the disparity including survivors, health professionals and those who have lost family to the particular health disparity. This process allows audience members not only the opportunity to ask questions, but also provides a context in which the audience is further informed and engaged in conversation in an effort to increase knowledge and change health related behavior. Although some studies have found significant increases in knowledge and pro-social related health behaviors using theatre [3], few have been used to address cervical cancer or assessed the impact of the "after play" question and answer session and panel discussion. Thus, the study seeks to add to the literature by not only 1) To evaluate the effectiveness of theater as an health education tool to increase knowledge and health related behavior regarding cervical cancer but also 2) To seek to elucidate the combined impact of the entire "ethno-drama experience" as an educational tool among women of color.

## Symptoms and Diagnosis

According to the NIH, the estimated amount of new cases for cervical cancer in 2019 is 13,170. In 2019 there were 4,250 estimated deaths of women from cervical cancer. In the early stages of cervical cancer, typically, there are no signs or symptoms of it, but it can be detected with regular check-ups. Signs and symptoms of cervical cancer include vaginal bleeding, pelvic pain, unusual vaginal discharge, and pain during sexual intercourse [15]. Once women have been diagnosed with cervical cancer the physician will determine treatment based upon the stage.

There are four stages of cervical cancer, which are Carcinoma *in situ* (Stage 0), Stage I, Stage II, Stage III, and Stage IV. Carcinoma *in situ* (Stage 0) abnormal cells are found in this stage in the inner lining of the cervix. Stage I cancer is only found in the cervix. Stage I is divided into stages IA and IB depending on the amount of cancer found. Stage IA consists of a minimal amount of cancer, which is located in the tissues of the cervix and can only be seen with a microscope. Stage II cancer spreads beyond the cervix but not into the pelvic wall or to the lower part of the vagina.

Stage III cancer spreads to the lower third of the vagina and/or onto the pelvic wall. Stage IV is divided into two stages IVA and IVB, which is based on where cancer has spread. During stage IVA, cancer has spread to nearby organs such as the bladder or rectum. Stage IVB is when cancer has spread to other parts of the body, such as the liver, lung, intestine, bone, or lymph nodes. Cervical cancer can recur after it has been treated and possibly come back in the cervix or other parts of the body.

## Treatment

There are several types of standard treatment techniques for patients with cervical cancer, i.e. surgery, radiation therapy, chemotherapy, targeted therapy, and immunotherapy [16]. The definition of radiation therapy is the use of high-energy X-rays or other types of radiation to kill cancer cells or keep them from growing. Cancer treatment for cervical cancer and other cancers that use drugs to stop the growth of cancer cells by either stopping the cells from dividing or killing which is referred to as Chemotherapy. It can be taken by mouth or injected into a vein or muscle.

The use of drugs or other substances to identify and attack specific cancer cells without harming healthy cells is known as targeted therapy. A treatment that uses substances to stimulate or suppress the patient's immune system to fight cancer, infections, and other diseases is known as Immunotherapy. Immunotherapy is also known as biotherapy or biologic therapy. The drug for immunotherapy can be made in a laboratory or by the body and used to boost, direct, or restore the body's natural defenses against cancer. However, these treatments can be quite costly and present a considerable financial burden to women of color who maybe the primary caretaker of their families, thus contributing to higher mortality rate among these women.

## Cervical Cancer and Women of Color

The rate of cervical cancer is 30% higher in non-Hispanic black women than non-Hispanic white women.

Cervical cancer rates for Hispanic women suggest they are 40 percent more likely to be diagnosed with cervical cancer, and 20 percent more likely to die from cervical cancer, as compared to non-Hispanic white women [17]. Minority women have high mortality rates from cervical cancer which is associated with low screening rates than white women [18]. In the United States, African American women have both a higher percentage of late stage diagnoses as well as a higher mortality rate for both breast and cervical cancer [19]. Lack of transportation, high cost, time constraints, no health insurance, feeling uncomfortable, and/or not having a trusted primary care specialist are some of the reasons that individuals do not seek medical care [20].

## Cervical Cancer Education and Intervention Efforts

Efforts to educate women about cervical cancer have included education interventions such as didactic health talks, workshops videos, use of culturally sensitive educational materials, letters with fact sheets on cervical cancer and screening, and cervical cancer screening brochures. The

effectiveness of these efforts in increasing knowledge and changing cervical cancer behavior vary and present some unique challenges for researchers. Although some of these efforts have been important in addressing cervical cancer among women of color, education level and or literary and socioeconomics have been a challenge. Lindau, et al. [21] found that minority women were half as likely to know the purpose of the Papanicolaou test and had lower literacy compared to their white counterparts. A study conducted by [19] found that fatalism, stigma, and privacy are the major factors that affect African American women's decisions to seek preventative screening measures for breast and cervical cancer [19].

O'Brien [22] using a two-part community-based workshop to address cervical cancer disparities among women. Researchers found that the intervention was effective in increasing cervical cancer knowledge, PAP smear screening, and self-efficacy among women. Attempts to investigate the effectiveness of breast cancer prevention have been undertaken by the Centers for Disease Control and Prevention (CDC) in a study by using culturally relevant information and Black radio in low income communities. Evaluation of their health promotion campaign found that radio was effective in reaching low-income African American women and increasing women's awareness of breast cancer screening services.

To bring clarity to the effectiveness of cervical cancer education efforts among high risk women a meta-analysis of 28 cervical cancer studies was conducted by Musa, et al. [23]. The aim of the meta- analysis was to assess if exposure to cervical cancer information increased the likelihood of screening among women high-risk for cancer. Over 3000 publications on cervical cancer from studies conducting on women of color from around the world were reviewed [23]. Many were omitted because they did not include a comparison group. The principal findings of this review are that theory-based educational interventions and use of culturally sensitive languages in communities with low participation rates for cervical cancer screening are effective interventions that significantly improve cervical cancer screening rates. As noted, although education and poverty present some unique challenges for health professionals and researchers to increasing knowledge and awareness and encouraging behavior change as it relates to cervical cancer. Education and engagement have proved effective in promoting screening. Moreover, given the high rates of cervical cancer and mortality among African American women, the need for more innovative educational and preventive approaches is imperative.

## The Use of Theater as a Cervical Cancer Education Tool

The use of theater and drama to educate individuals about health disparities has gained prominence. Health educators and researchers around the world have used theater to address various health challenges and disparities (i.e. Malaria, Addiction, HIV/ AIDS and breast cancer Patsimeredu Edutainment Trust [PET], 2008) [3,14,24,25]. International researchers and health educators have found it to not only to be effective in raising awareness about a particular health issue, but it also leads to a health-related behavioral change. In the U.S., over the past ten years, more researchers are beginning to see the utility of using theater to educate communities about health disparities and encourage screening and preventing behaviors. Using theater, found it to be an effective tool in educating Alaska natives about cervical and colorectal cancer. They used a 25-minute script developed by and for Alaskan natives and American Indian Community Health Workers (CHWs) to encourage discussion and lifestyle change regarding cancer. Participants reported increased knowledge and felt more comfortable talking about cervical and colorectal cancer after the play. Moreover, playgoers discussed the healthy changes they intended to make as a result of reviewing the production. Livingston, et al. [3] in a study investigating the effectiveness of a theater production, "Stealing Clouds", in increasing young women knowledge about breast cancer, found theater to be effective in not only increasing knowledge about breast cancer but participants reported increased likelihood of getting mammography examinations. One hundred and thirty-six African American women between the ages of 18 and 39-years-old participated in the study. The study used a retrospective pre-post-test design that assessed the impact of theater on young women's knowledge and propensity to engage health-related behaviors (i.e. self-exams and screening mammography exams). Paired sample t-tests revealed significant increases in knowledge about breast cancer and mammograms. The results of this study indicated a significant increase in participant's intentions to change behavior and also wanting to become more involved in efforts to reduce breast cancer in the African American community [3].

Cameron, et al. [26] also found theater to be an effective cancer education tool in increasing knowledge among African American men about prostate cancer. To test whether theater was more effective than a standard workshop, researchers used a play "Fourth and a Mile" based upon a small-town coach from the south who struggle with explaining his diagnose of prostate cancer to 3 generation of men he has coached. After viewing the play, researchers found statistically significant increases in knowledge for playgoers after the play.

Participants also reported statistically significant increases in the likelihood of engaging in healthy pro-social prostate-related behaviors (i.e. importance of screening and early detection and regular screening). Rustveld, et al. [27] found theater to be effective in disseminating information about the importance of cervical and colorectal cancer among communities of color and the likelihood of being screened 6 months after the production. In a sample of 662 participants, they were able to improve accurate knowledge about both cervical and colorectal cancer by using theater as an education tool. Also found arts-based cancer education to be an effective tool in delivering colorectal screening. Utilizing faith-based community leaders, health and drama ministries at a local church in the south and the expertise of the local state university, a culturally centered play call Rise Up, Get Tested, and Live was developed. Data collected after the production revealed increased knowledge about colorectal

cancer increased awareness and understanding of the importance of screening. Suggested that theater as a health educational tool allows for interpersonal communication (i.e., question and answer time, applause, verbal commentary from the audience) thus reinforcing and unpacking the messages conveyed in the play, However, few studies have tested the impact of the "after play" engagement (panels discussions and question and answers) on participants. What is the impact of the "after play" engagement? Does it influence participant's knowledge and encourage health related behavior? To advance our understanding of the impact, the present study seeks to elucidate the methodological advantage of using the "ethno-drama" experience as a health educational tool.

Although the utility of theater has proven effective in increasing knowledge and changing behavior to date there is limited research investigating the use of an ethno-drama educational experience as a health educational intervention tool to increase knowledge and pro-social health behaviors regarding cervical cancer. Moreover, there exist few empirical studies examining both the theatrical production and the "after play" discussion and panels on participant knowledge and health related behavior change. Therefore, the current study is twofold 1) To add to the literature on cervical cancer and HPV in participants of color and 2) Expand our understanding of the utility of the ethno-drama experience as a health educational intervention tool. Thus, the following research questions were investigated.1. Will the ethno-drama experience increase knowledge about cervical cancer and HPV? 2. Will the use of theater increase pro-social health-related behaviors, (i.e., screening and prevention) among participants?

## Methods

### Design

The current study assessed the effectiveness of the ethno-drama experience as a tool to increase knowledge and awareness as well as the propensity to change behavior (i.e., screening, pap smear, follow-up) among participants of color in regard to cervical cancer. A standard pre/post-test research design was employed. Data on cervical cancer knowledge, awareness, and behavior were collected at two time periods. Time 1) Before the play, Time 2) After the "ethno-drama experience" (which includes the play production on cervical cancer, and a panel discussion among family member's survivors and health care workers). Paired sample t-test were employed to test mean differences in participant's responses before and after the play. Data were analyzed using SPSS version 25 to assess increases in cervical cancer literacy, and differences in knowledge across levels of education. Twenty percent of the data was randomly re-entered to ensure accuracy. Frequencies and distributions were run to ensure that data was within acceptable ranges. Spearman's rho correlations were calculated to examine the relationship between the primary variables of the study.

### Ethnodrama intervention

The ethnodrama used to increase knowledge about cervical cancer and encourage health related behaviors was entitled "*Write Now We Will Heal"*. The play provided audiences information about HPV and Cervical Cancer throughout the play narratives and scenes were written in order to articulate the etiology of HPV and Cervical Cancer signs and symptomology as well as prevention and intervention strategies throughout the script participants were encouraged to improve health related behaviors and get annual gynecological exams. The play lasted for an hour and twenty minutes. There was a 15-minute intermission where participants were provided refreshments. The play was shown two nights in each city. Although the play was not interactive the set design and theater were small enough to create a more initiate setting to discuss sensitive topics such as reproductive health.

### Participants

Over 200 plus participants attended the ethno-drama experience which was held in 2 large cities in the southeast. The play "Write Now We Will Heal" was conducted at theaters at two historically black colleges in the southeast. One-hundred and one (101) participants elected to participate in the study. Individuals who participated in the study had to report they were 18 years of age and older. Participants responses were removed if they did not complete the survey. The participants ranged in age (R = 18-62), with 24.8% of the participants being between 40-50 years of age. Over 30 percent of the sample reported having a graduate degree, 21.0% indicated that they had 4-years of college education. In regard to having attended an ethno-drama previously, 16.2% of participants reported yes, and 51.4% of participants reported no. Over 80.0% of participants reported being insured, while 16.2% were not insured. In regard to having a pap test, 70.5% reported yes that they had a Pap Smear, and 22.9% reported no. Over 91% of participants indicated that they knew where to go in case of a medical emergency. A total of 44.8% of participants indicated that the last time they had a physical checkup was six months ago. Descriptive information for participants can be found in Table 1.

### Procedures

Participants were recruited through a public relations campaign in which social media, podcast radio, and flyers were sent and posted throughout the community. Letters were sent to community centers and churches, asking them to place the information within their businesses or organization. Research project staff and students met with and recruited participants from businesses, community events, churches in low-income communities that may have limited access to health education information.

Once participants arrived at the theatre production, they were given folders with the informed consent, pre-test, post-test, and pamphlets before being escorted into the theater. Participants were provided educational material on cervical cancer, where to get screened, and the importance of women of color participating in clinical trials inside of the resource folders provided by the research team. An individual from the research team was on stage to explain the nature of the study and informed consent to the large group. Participants were

**Table 1:** Descriptive statistics for participants (n = 101).

| Variables | n | % |
|---|---|---|
| **Age** | **101** | **96.2** |
| 18-28 | 16 | 15.2 |
| 29-39 | 22 | 21.0 |
| 40-50 | 26 | 24.8 |
| 51-61 | 19 | 18.1 |
| 62+ | 18 | 17.1 |
| **Highest Education Level** | **101** | **96.2** |
| High School | 18 | 17.1 |
| Vocational School | 3 | 2.9 |
| 2- year Community College | 9 | 8.6 |
| 4 Year College | 22 | 21.0 |
| Graduate School | 32 | 30.5 |
| Post-Graduate School | 17 | 6.2 |
| **Have You Ever Attended an Ethno-drama?** | **71** | **67.6** |
| Yes | 17 | 16.2 |
| No | 54 | 51.4 |
| **Are You Currently Insured?** | **101** | **96.2** |
| Yes | 84 | 80.0 |
| No | 17 | 16.2 |
| **Do You Know Where to Go In a Medical Emergency?** | **98** | **93.3** |
| Yes | 96 | 91.4 |
| No | 2 | 1.9 |
| **When Was the Last Time You Went for a Physical Check Up?** | **101** | **96.2** |
| Last month | 17 | 16.2 |
| Six months ago | 47 | 44.8 |
| A year ago | 25 | 23.8 |
| Over a year | 121.4 | |
| **Have You Ever Had a Pap?** | | |
| **Test** | **98** | **93.3** |
| Yes | 74 | 70.5 |
| No | 24 | 22.9 |
| **If yes was it in the past** | **68** | **64.8** |
| Year | 49 | 46.7 |
| 3 years | 11 | 10.5 |
| 5 years | 8 | 7.6 |
| **Have You Had Unprotected Sex in the Past Year** | **100** | **95.2** |
| Yes | 46 | 43.8 |
| No | 54 | 51.4 |
| **How Many Times Have You Been to the Doctor To Receive a Physical (within the last 5 years)?** | **97** | **92.4** |
| Once | 11 | 10.5 |
| Twice | 14 | 13.3 |
| Three times | 16 | 15.2 |
| More than three Times | 56 | 53.3 |

given the opportunity to discuss concerns with the research team prior to consenting and participating in the study.

After completing the consent process, participants were asked to complete the demographic questionnaire and pre-test to assess knowledge and health-related behavior. Upon completion of the informed consent form and pre-test, participants viewed the ninety-minute ethno-drama play at specified locations within the community. During the intermission, participants were asked to provide the research team with their completed pre-test to be placed in a lockbox before enjoying light refreshments in the reception hall.

After the play, participants were asked to complete a post-test questionnaire to assess cervical cancer knowledge and the likelihood of engaging in pro-social health-related behavior. Participants were also asked to provide contact information, so they can be contacted again to see if the play increased the likelihood of screening, participation in clinical trials, and pro-social health-related behavioral change (screenings, follow up visits, annual checkups, safe sex practices). Participants also engaged in a panel discussion with individuals and professionals from the community who are knowledgeable on the topic of cervical cancer. After completion of panel discussion and collection of post-test responses, members of the research team raffled two $50 gift cards for participants in the audience. The play was free of charge, and participants had an opportunity to win an incentive (i.e., $50 gift card) for their participation.

## Measures

### Demographics

Participant's demographics, such as age, educational level, and previous ethno-drama attendance, were collected from participants via self-report. Participants were also asked about health history (i.e., having insurance, recent pap smear test, physical checkups, and unprotected sex within the past year). The questionnaire consisted of 10-questions.

### Cervical cancer literacy

The Cervical Cancer Literacy Assessment was used. The original author, Karen P. Williams, developed the Cervical Cancer Literacy Assessment Tool (C-CLAT), which is a seventeen-item scale that measures a person's knowledge, awareness, and understanding of prevention/control of cervical cancer [28]. The scale has been modified for this study to be inclusive to male and female participants. The scale, consisting of twenty-one items, it measures a basic level of cervical cancer knowledge, awareness, prevention, and screening. It has a Cronbach's alpha of 0.72. (See Appendix B).

The scale was augmented by researchers to assure that the scale was developed at the reading level of targeted participants in the current study to assess participants' understanding of themes articulated in the "ethno-drama" intervention. The awareness scale is a three-item true/false measure that measures awareness of HPV and cervical cancer. The alpha coefficient was -0.07 (See Appendix B). An example of an awareness item on the scale is, "Cervical cancer is preventable." The knowledge and screening scales consist of five true/false items and two multiple-choice items. The alpha coefficient was 0.35. An example of a knowledge and screening item is "A woman should start having a pap test after becoming sexually active, when she turns 21, or whichever comes first." An example of the multiple-choice item is, "A woman should request a pap test from a health care provider if she has." The prevention and control scale consist of five true/false statements and two multiple-choice items. The alpha coefficient was -0.14 (See Appendix B). An example of a prevention and control true/false item is, "Pre-cancerous changes and early stages of cervical cancer usually do not cause pain. "An example of a prevention and control multiple-choice item is, "The following are risk factors for cervical cancer." The instrument was found to have good internal reliability. To obtain a total scale score, each subscale (Knowledge, Awareness, and Prevention and Control) were summed.

## Results

Data were analyzed using SPSS Statistics for Windows, version 25 to assess increases in cervical cancer literacy, and differences in knowledge across levels of education. Twenty percent of the data was randomly re-entered to ensure accuracy. Frequencies and distributions were run to ensure that data was within acceptable ranges. Spearman's rho correlations were calculated to examine the relationship between the primary variables of the study. Over 105 play goers elected to participate in the study. Mean age of participants, percentage that had a pap smear in the past year, frequency of doctor visit, insurance.

As previously mentioned, to assess the relationship between primary variables. The results revealed that there was a significant positive relationship between awareness and knowledge and cervical cancer literacy ($r = 0.31$, $p \leq 0.01$). Thus, playgoers who reported higher awareness and knowledge of cervical cancer reported higher scores on the cervical cancer literacy survey. There was a significant positive relationship between cervical cancer literacy and knowledge and screening ($r = 0.56$, $p \leq 0.001$). Playgoers who participated in the study indicated high cancer literacy also reported more knowledge of the importance of knowing about gynecological screenings. There was a significant positive relationship between cervical cancer literacy and prevention and control ($r = 0.39$, $p \leq 0.01$). There was a significant positive relationship between knowledge and screening and prevention and control ($r = 0.31$, $p \leq 0.01$). Thus, knowledge and screening among participants was related to their recognition and awareness of preventing practices to reduce HPV and Cervical Cancer i.e., (safe sex practices). There were no relations between education and awareness, knowledge and screening, prevention and control, and overall cervical cancer literacy. See Table 2.

### Increase in knowledge from time 1 to time 2

Paired sample t-tests were run to investigate differences in cervical cancer knowledge before and after the ethno-drama play among participants in both cities. The results of

**Table 2:** Correlation results for primary variables (n = 101).

| Variables | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. Education | -- | | | | |
| 2. Awareness | 0.02 | -- | | | |
| 3. Know & Screen | 0.01 | 0.07 | -- | | |
| 4. Prevent & Control | 0.08 | 0.05 | 0.31** | -- | |
| 5. Cervical Cancer Lit | 0.03 | 0.31** | 0.56** | 0.39** | -- |

**Note:** *p ≤ 0.05, **p ≤ 0.01, ***p ≤ 0.001.

**Table 3:** Paired sample T-test differences of knowledge between pre- and post-test (total sample).

| Variables | Pre-Test | | Post-Test | | *t* |
|---|---|---|---|---|---|
| | M | SD | M | SD | |
| Knowledge and Screening | 12.84 | 1.07 | 13.05 | 0.88 | -1.66 |

*p ≤ 0.05; **p ≤ 0.01; ***p ≤ 0.001.

**Table 4:** Paired sample T-test differences of pro-social health behaviors between pre- and post-test (total sample).

| Variables | Pre-Test | | Post-Test | | *t* |
|---|---|---|---|---|---|
| | M | SD | M | SD | |
| Prevention and Control | 9.97 | 0.81 | 12.05 | 0.79 | -15.93**** |

*p ≤ 0.05; **p ≤ 0.01; ***p ≤ 0.001.

this analysis indicated that there was not a significant increase in knowledge about screening after the play ($M_{\Delta}$ = 0.20, SD = 0.97), t (63) = -1.66, p = ns. For additional results, see Table 3.

## Increasing in prevention and control behaviors from time 1 to time 2

Paired samples t-test were run to assess increases in intended or reported likely hood of pro-social health behaviors (i.e., prevention and control) before and after the ethno-drama play among participants in both cities. The results of the data indicated that there were significant increases intended or the likelihood of prevention-related behaviors (intention to get screened, safe sex and regular pap smear exam) after the play ($M_{\Delta}$ = 2.08, SD = 1.00), t (58) = 15.93, p ≤ 0.001. For additional results, see Table 4.

## Discussion

The primary purpose of this was to increase participants' knowledge and awareness and increase overall pro-social health-related behaviors (i.e., screening, vaccination, and prevention and control) related to cervical cancer and HPV. The present study sought to fill in the gaps in the literature on cervical cancer and the use of ethno-drama theater as a tool to increase knowledge, awareness, and increase engagement in pro-social health behaviors related to cervical cancer and HPV. At this point, a dearth of studies has utilized ethno-drama theater as an educational tool to educate communities on relevant health disparity [3,26]. Currently, there is no research on cervical cancer and the use of ethno-drama theater as an educational tool. Therefore, the present study sought to utilize ethno-drama theater as an educational tool to increase knowledge, awareness, and prevention and control regarding cervical cancer in local communities.

The first research question suggested that the ethno-drama intervention would significantly increase knowledge about HPV and cervical cancer among participants from time 1 (before play) to time 2 (after play). The paired samples t-test results indicated that there was not a significant increase in knowledge. Researchers believe that the research question was not supported due to the small sample size. These results are not concurrent with previous studies. In previous research conducted by [3,26] participants reported increased knowledge about breast and prostate cancer after the ethnodrama experience at Time 2.

The second research question suggested that there would be a significant increase in participant willingness to engage in pro-social health behaviors regarding cervical cancer (cancer screening and PAP smears) from Time 1(Pre-Play) to Time 2 (Post-Play). The results of the paired sample t-test were validated. These findings are consistent with other studies that have found to be effective in encouraging health related behavioral change. Cameron and colleagues [26] found theater to be effective in encouraging prostate cancer screening among participants after the ethnodrama experience. Although hypothesis 1 was not supported the use of plays and ethnodramas to address reproductive cancers (i.e., cervical, uterial, prostate) may prove effective in encouraging discussion about sexual health and cancer among families and communities of color. Given the desperate rates, sensitive nature of cancer and sexuality in the for mentioned communities theater as a prevention tool may aid health educators and researchers facilitate more discussion in a

non medical setting which may give community members an opportunity to discuss and unpack concerns and barriers seeking treatment for reproductive cancers.

## Limitations

As noted, this study was the first attempt to not only investigate the use of dramatic plays to educate people of color about cervical cancer and HPV, but it seeks to expand our understanding of the utility of the ethno-drama experience as a health educational intervention tool. Although the play proved effective in encouraging health related behaviors as it relates to cervical cancer, there were challenges in regard to measurement and sampling that future studies investigating the utility of theater as an educational tool will have to address. As evidence by low reliabilities and participant's inquiry and consternation expressed when completing the survey, future studies may be improved by the development and/or augmentation of and piloting of instruments that are consistent with the reading levels and common nomenclature of said community or population. This will improve comprehension of medical terms used to describe disease risk, trajectory or progression. Moreover, given the influence of regional religious values, some communities are reluctant to discuss reproductive health and physio-anatomy. Researchers employing theater as a health education tool will need 1) Use community focus groups among community stakeholder to discuss the appropriateness of various surveys and item language prior to dissemination.; and 2) Given the sensitive nature of reproductive cancers, researchers will need determine adequate and more importantly the appropriate audience sample size for the delivery of theatrical performances on reproductive cancers (cervical, uterus, testicular and prostate). Both men and women in the current study expressed an uncomfortableness with survey content and inability to understand or answer questions on the survey due to the setting and lack of knowledge or clarity as it related to the survey. This may have impacted responses and participation in the study.

## Implications

The current study provides evidence that cervical cancer literacy and pro-social health-related behaviors among playgoers, both males and females, can be influenced by the use of theater. The ethno-drama performance, "Write Now, We Will Heal," was a community-based, theatrical approach to informing communities of color about cervical cancer. The play was found to be effective in increasing literacy, awareness, and pro-social health-related behaviors such as To date, this was the first attempt among researchers to use theatre as a tool to educate participants about cervical cancer. The current study extended the previous work using theatre as a health education tool by assessing the impact of the after-play panel on participants' knowledge and behavior. As noted, in previous studies employing theatre using the standard pre-post design or retrospective pre- post-test design, researchers have not tested the influence of the panel members "after play" discussion. The after-play panel discussions, although widely used in theatrical presentations about health, have not been tested as an intervention or heath education tool. These after play discussions and panels provide audience members an opportunity to hear from survivors and health professionals from their own community. For many participants this further educates the audience and emotionally localizes the disease by unpacking themes and narratives about etiology, risk, and prevention. Participants have an opportunity to ask questions about the disease, where to get screened or tested as well as share their own experiences with health disparities. Thus, the current study may add to the literature on the use of theater and cervical cancer education, and the utility of the "ethno-drama experience" as an educational tool.

## Future Directions

The current study was a pilot and a preliminary study to assess the effectiveness of the ethno-drama tool. Future studies seeking to utilize the "ethno-drama experience" and to assess changes in knowledge, health behaviors, and attitudes should recruit a larger and more representative sample of participants from different ethnic groups. Moreover, to test whether the "ethno-drama experience" is a more effective tool than standard theatre, researchers should test the effectiveness of both designs across various health disparities. Investigating the use of theatre to address cervical cancer and reproductive health (cervical and prostrate) will need to employ a community- based participatory approach, wherein relationships are established a year prior with the community to identify key stakeholders to 1) Help researchers recruit participants, 2) Understand the communities' knowledge and comfort with discussing reproductive health, sex and cancers. In addition to the forementioned approaches, researchers will need to also the use focus groups to assess where and who women of color get information about cervical cancer, HPV, and reproductive health. What are the salient messages articulated by health professionals to women of color? How do these narratives influence their perception of cervical cancer and likelihood of screening and recruitment? This will also aid in the vetting, augmentation and/or creation of valid psychometric health education instruments that are consistent with reading levels and culture of urban populations.

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