STM JOURNALS

International Journal of
Oncological Nursing and Practices

Volume 2, Issue 2, 2024
July—December
DOI (Journal): 10.37591/IJONNP

https://journals.stmjournals.com/ijonnp

Research IJONNP

The Effectiveness of a Nurse-led Cervical Cancer Prevention Program Among Reproductive-age Women in Selected Areas of Chennai

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Abstract

Background: *Cervical cancer remains a major global health issue, significantly impacting women's health. Early detection and preventive measures through screening, along with enhanced awareness, are vital in lowering mortality rates associated with this disease. This study aimed to evaluate the effectiveness of a nurse-led cervical cancer prevention program in improving knowledge and practice related to cervical cancer prevention among women.* ***Methods:*** *This quasi-experimental study was conducted with 60 women divided into an experimental group and a control group, each consisting of 30 participants. The experimental group received a nurse-led cervical cancer prevention program, while the control group received no intervention. Data were collected using pretest and post-test assessments on knowledge and practice levels regarding cervical cancer prevention. Statistical analyses utilized Student's independent t-tests and paired t-tests to evaluate the significance of changes in knowledge and practice scores.* ***Results:*** *It indicated that the socio-demographic characteristics of both groups were comparable regarding age, education level, occupation, family income, and marital status. Pretest results showed that both groups had inadequate knowledge and poor practice levels concerning cervical cancer prevention. Post-intervention, the experimental group demonstrated a significant improvement in both knowledge and practice levels, with all participants moving from inadequate to moderate or adequate knowledge levels and none showing poor practice. In contrast, the control group still exhibited high levels of inadequate knowledge and poor practice. Statistical analyses confirmed that the improvements in the experimental group were highly significant ($p<0.001$).* ***Conclusion:*** *The study highlights the effectiveness of the nurse-led cervical cancer prevention program in significantly enhancing both knowledge and practice regarding cervical cancer among women in the experimental group. This intervention led to a marked improvement in cervical cancer awareness and preventive practices, underscoring the importance of educational programs in combating cervical cancer.*

Keywords: Cervical cancer, prevention program, knowledge improvement, practice improvement, nurse-led intervention, screening, women's health

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Received Date: August 02, 2024
Accepted Date: October 25, 2024
Published Date: November 15, 2024

Citation: V. Yamunarani, B. Lingeswari. The Effectiveness of a Nurse-led Cervical Cancer Prevention Program Among Reproductive-age Women in Selected Areas of Chennai. International Journal of Oncological Nursing and Practices. 2024; 2(2): 6–13p.

INTRODUCTION

Women are often seen as the cornerstone of both society and the family unit. While we can construct luxurious homes, we cannot create a loving and nurturing family environment without the integral presence of a mother. As Mahatma Gandhi famously said, "*Woman is the companion of man gifted with equal mental capacity.*" This highlights the crucial role women play in our lives and underscores the importance of addressing their health needs, particularly in the realm of reproductive health. The uterus, a vital organ in the reproductive system, is a hollow muscular structure located in the pelvic cavity,

positioned between the urinary bladder and rectum. It comprises three parts: the fundus, body, and cervix. Ensuring the health of this organ is critical, yet many women face barriers in accessing healthcare due to factors such as family circumstances and economic conditions [1].

Cancer, a leading cause of mortality in India, claims approximately 0.3 million lives annually. The rise in cancer cases can be attributed to lifestyle changes, including dietary habits, and the interplay of genetic and environmental factors. This fearsome disease often evokes dread of pain, suffering, and mortality, not only in patients but also among their families. Numerous cancers, including cervical cancer, can be prevented through early detection and timely treatment. Cervical cancer is a significant health problem and is among the top causes of cancer-related fatalities in women, with over 25% of the global burden occurring in developing countries. In India, cervical cancer resulted in 60,070 deaths in 2018, predominantly affecting women aged 30 to 39. India, contributing to 16% of the global cervical cancer cases, faces a severe challenge in combating this disease. According to the Globocan 2018 report, cervical cancer accounted for 8.4% of new cancer cases in India, following breast cancer and oral cavity cancers. The leading cause of the majority of cervical cancer cases is the human papillomavirus (HPV). Risk factors for developing cervical cancer include early marriage, early sexual activity, having multiple sexual partners, poor genital hygiene, and a history of HPV infection. In particular, HPV types 16 and 18 are responsible for about 70% of cervical cancer cases and precancerous lesions globally. Fortunately, cervical cancer can be effectively prevented if identified at the precancerous stage. Primary prevention aims to lower cancer risk among healthy individuals, while secondary prevention emphasizes early detection and treatment to prevent cancer progression. Vaccination against HPV before exposure offers significant preventive advantages. Although HPV vaccines cannot completely eliminate the risk of cervical cancer, they significantly reduce it, and regular cervical screening remains crucial. The American Cancer Society advises regular screenings to reduce cervical cancer mortality. Women between the ages of 21 and 29 should undergo a Pap smear every three years, while those aged 30 to 65 should receive both Pap smears and HPV tests every five years. Women over 65 may continue screening based on their history of abnormal results. Despite these recommendations, knowledge about cervical cancer risks and screening is lacking, particularly among women from low socioeconomic backgrounds. Many are unaware of available health services or are reluctant to participate due to various barriers. Raising public awareness about cervical cancer prevention is crucial for improving screening rates and outcomes [2–4].

Nurse-led cervical cancer prevention programs play a pivotal role in educating women about healthy lifestyle practices and the importance of regular screenings. The study area, Choolai, under the upgraded primary health center, has seen low engagement in screening despite the Tamil Nadu government's provision of free services. This underscores the need for enhanced awareness efforts and targeted interventions to improve cervical cancer prevention and control [5–8].

METHODS

This study employed a quantitative research method to assess the effectiveness of a nurse-led cervical cancer prevention program targeting women of reproductive age in Chennai. A quasi-experimental, non-randomized control group design was utilized, consisting of both an experimental group and a control group. The research included pre-test and post-test evaluations to gauge knowledge and practices concerning cervical cancer prevention. The experimental group took part in a nurse-led program aimed at preventing cervical cancer, whereas the control group did not receive any form of intervention. The study was conducted in Choolai urban area, with the experimental group drawn from Astabujam Street and the control group from Avadi Srinivasan Street. Data collection spanned four weeks from January 20, 2020, to February 15, 2020. The target population comprised reproductive-age women in Choolai, with the accessible population including those available during the data collection period in the specified streets. The sample included 60 women selected based on criteria such as willingness to participate, ability to speak and understand Tamil, and exclusion of those who had undergone hysterectomy or were ill on the data collection day. Participants were selected using non-probability purposive sampling based on specific criteria.

RESULTS

The demographic data indicates significant differences between the experimental and control groups. While the majority of women in both groups are aged 30 to 39, this age bracket is more pronounced in the control group. Both groups have a high level of educational attainment, but there are slightly more women with degrees in the control group. Additionally, a larger percentage of women in the control group are housewives compared to those in the experimental group. Income levels are similar, with most participants in both groups earning between Rs. 15,001 and 25,000. Most of the participants are married, and there are no notable differences in marital status between the two groups (Table 1).

Table 1. Distribution of Socio-demographic Characteristics of women **(N=60)**

Demographic Variables	Experiment (n=30)	Control (n=30)
Age in years		
20 - 29 years	9 (30.00%)	8 (26.67%)
30 - 39 years	12 (40.00%)	16 (53.33%)
40 years and above	9 (30.00%)	6 (20.00%)
Educational status		
School level	19 (63.33%)	17 (56.67%)
Degree level	6 (20.00%)	7 (23.33%)
Non-literate	3 (10.00%)	4 (13.33%)
Others	2 (6.67%)	2 (6.67%)
Occupation		
Government	3 (10.00%)	3 (10.00%)
Private	9 (30.00%)	6 (20.00%)
House wife	18 (60.00%)	21 (70.00%)
Family income		
Rs. 5,000 - 15,000	11 (36.67%)	8 (26.67%)
Rs. 15,001 - 25,000	15 (50.00%)	17 (56.67%)
Rs. 25,001 - 35,000	4 (13.33%)	5 (16.66%)
Age at marriage		
Below 18 years	8 (26.67%)	6 (20.00%)
18 years to 24 years	17 (56.67%)	18 (60.00%)
25 years to 30 years	5 (16.66%)	6 (20.00%)
Marital status		
Single	0 (0.00%)	0 (0.00%)
Married	27 (90.00%)	28 (93.33%)
Separated	2 (6.67%)	2 (6.67%)
Others	1 (3.33%)	0 (0.00%)
Number of children		
Single	12 (40.00%)	12 (40.00%)
Two children	15 (50.00%)	16 (53.33%)
More than two	3 (10.00%)	2 (6.67%)
Age of menarche		
10-12 years	19 (63.33%)	15 (50.00%)
13-15 years	11 (36.67%)	15 (50.00%)
Menstrual cycle		
Regular	22 (73.33%)	20 (66.67%)
Irregular	8 (26.67%)	10 (33.33%)
History of Reproductive Tract Infection		
Yes	7 (23.33%)	12 (40.00%)
No	23 (76.67%)	18 (60.00%)

Demographic Variables	Experiment (n=30)	Control (n=30)
Don't know / no idea	0 (0.00%)	0 (0.00%)
Family planning methods Used		
Temporary	6 (20.00%)	4 (13.33%)
Permanent	11 (36.67%)	10 (33.34%)
Nothing	13 (43.33%)	16 (53.33%)
Family history of cervical cancer		
Yes	2 (6.67%)	0 (0.00%)
No	28 (93.33%)	30 (100.00%)

When it comes to family planning, both groups use a mix of temporary and permanent methods, but the experimental group has more women using permanent methods. There is a noticeable difference in the history of reproductive tract infections, with more women in the control group reporting these issues. Women in the experimental group tend to have their first period a bit earlier than those in the control group. There are also a few more women in the experimental group with a family history of cervical cancer, but overall, these numbers are quite low in both groups.

Table 2. Comparison of Pretest and Post-test Levels of Knowledge about Cervical Cancer Prevention in Experimental and Control Groups (N=60).

Level of Knowledge	Pretest		Post-test	
	Experiment	***Control***	***Experiment***	***Control***
	N (%)	*N (%)*	*N (%)*	*N (%)*
Inadequate	23 (76.67%)	21 (70.00%)	0 (0.00%)	18 (60.00%)
Moderate	7 (23.33%)	9 (30.00%)	8 (26.67%)	12 (40.00%)
Adequate	0 (0.00%)	0 (0.00%)	22 (73.33%)	0 (0.00%)
Total	30 (100.00%)	30 (100.00%)	30 (100.00%)	30 (100.00%)
Chi-Square Test	χ^2=0.34 (p=0.56)		χ^2=40.80 (p<0.001)	

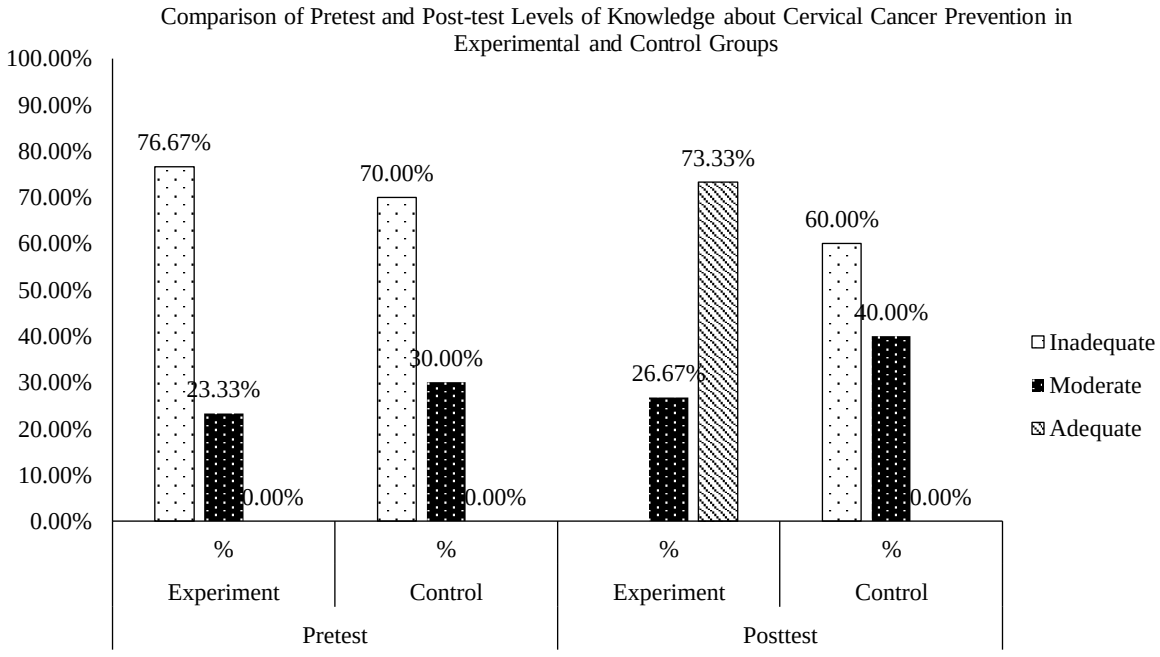

Figure 1. Percentage distribution of pretest and post-test levels of knowledge about cervical cancer prevention in experimental and control groups.

Table 3. Comparison of Pretest and Post-test Levels of Practice about Cervical Cancer Prevention in Experimental and Control Groups (N=60).

Level of Practice	Pretest		Post-test	
	Experiment	***Control***	***Experiment***	***Control***
	N (%)	**N** (%)	**N** (%)	**N** (%)
Poor	19 (63.33%)	20 (66.67%)	0 (0.00%)	17 (56.67%)
Moderate	11 (36.67%)	10 (33.33%)	7 (23.33%)	13 (43.33%)
Good	0 (0.00%)	0 (0.00%)	23 (76.67%)	0 (0.00%)
Total	30 (100.00%)	30 (100.00%)	30 (100.00%)	30 (100.00%)
Chi-Square Test	χ^2=0.07 (p=0.78)		χ^2=41.80 (p<0.001)	

The Table 3 indicates a notable enhancement in the practice levels of the experimental group following the intervention. Before the intervention, most women in both the experimental and control groups had poor practice scores, with 63.33% in the experimental group and 66.67% in the control group. However, after the intervention, none of the women in the experimental group had poor practice scores, and 76.67% of them had good practice scores. In contrast, 56.67% of the women in the control group still had poor practice scores. This indicates that the nurse-led cervical cancer prevention program was effective in improving the practice levels among the women in the experimental group (Figure 2).

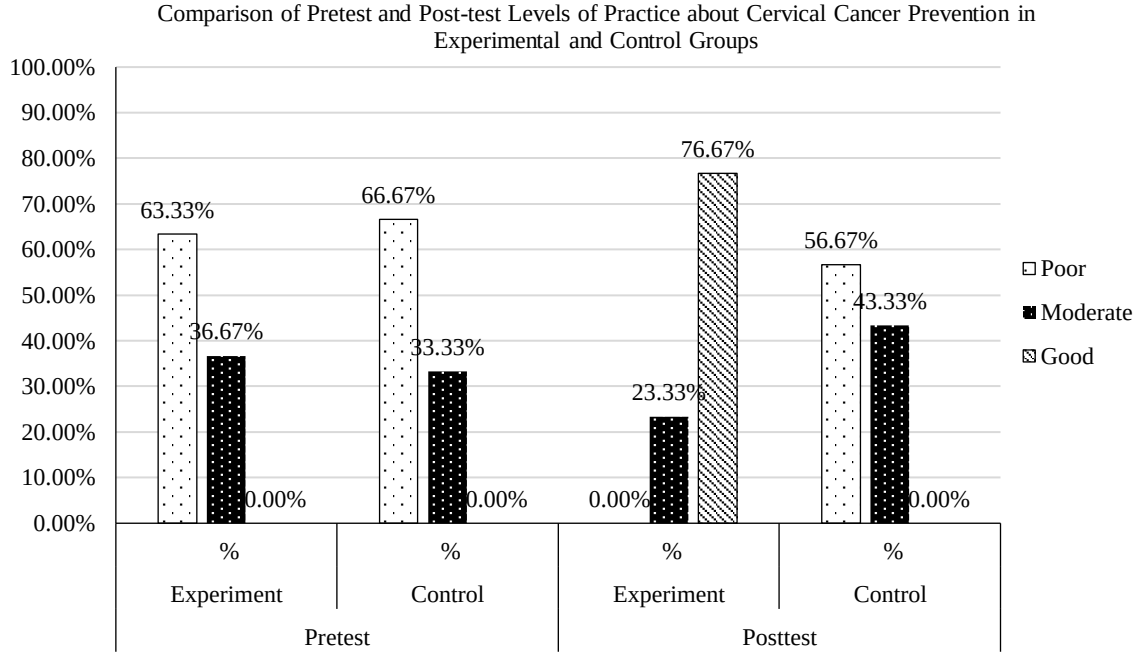

Figure 2. Percentage distribution of pretest and post-test levels of practice about cervical cancer prevention in experimental and control groups.

Table 4. Comparison of Pretest and Post-test Mean Knowledge Scores Between Experimental and Control Groups (N=60).

Test	Group	Mean Knowledge Score	Std. Deviation	Mean Difference	t-value	p-value
Pretest	Experiment	9.33	1.58	0.20	0.35	0.73
	Control	9.53	2.74			
Post-test	Experiment	15.4	2.01	5.33	9.66	<0.001
	Control	10.07	2.26			

The Table 4 indicates that prior to the intervention, there was no significant difference in mean knowledge scores between the experimental and control groups, with scores of 9.33 and 9.53, respectively. However, after the intervention, the experimental group's mean knowledge score rose significantly to 15.40, while the control group's score only marginally increased to 10.07. The mean difference of 5.33 between the post-test scores of the two groups was highly significant, suggesting that the nurse-led cervical cancer prevention program effectively enhanced the knowledge of the women in the experimental group.

Table 5. Comparison of Pretest and Post-test Mean Practice Scores Between Experimental and Control Groups (N=60).

Test	Group	Mean Knowledge Score	Std. Deviation	Mean Difference	t-value	p-value
Pretest	Experiment	4.80	1.40	0.17	0.44	0.66
	Control	4.63	1.52			
Post-test	Experiment	8.17	1.26	3.17	7.62	<0.001
	Control	5.00	1.89			

The Table 5 demonstrates that prior to the intervention, there was no significant difference in the mean practice scores between the experimental group and the control group, which recorded scores of 4.80 and 4.63, respectively. However, following the intervention, the experimental group's mean practice score significantly increased to 8.17, while the control group's mean score rose only to 5.00. The mean difference of 3.17 between the post-test scores of the two groups was highly significant, demonstrating that the nurse-led cervical cancer prevention program was effective in enhancing the practices of the women in the experimental group.

Table 6. Comparison of pretest and post-test mean knowledge scores within experimental and control groups (N=60).

Group	Test	Mean	SD	Mean Knowledge Gain Score	Paired t-test	p-value
Experiment	Pretest	9.33	1.58	6.07	14.72	<0.001
	Post-test	15.40	2.01			
Control	Pretest	9.53	2.74	0.54	1.81	0.07
	Post-test	10.07	2.26			

The Table 6 shows that in the experimental group, the mean knowledge score significantly increased from pretest to post test with a mean gain of 6.07, indicated by a highly significant p-value (p=0.001). This indicates that the nurse-led cervical cancer prevention program was successful in enhancing knowledge. In contrast, the control group had a minimal and not significant increase in their mean knowledge score, with a mean gain of only 0.54 and a p-value of 0.07.

Table 7. Comparison of pretest and post-test mean practice scores within experimental and control Groups (N=60).

Group	Test	Mean	SD	Mean Practice Gain Score	Paired t-test	p-value
Experiment	Pretest	4.80	1.40	3.37	8.89	<0.001
	Post-test	8.17	1.26			
Control	Pretest	4.63	1.52	0.37	1.89	0.06
	Post-test	5.00	1.89			

The Table 7 shows the comparison of pretest and post-test mean practice scores for both the experiment and control groups. In the experiment group, there was a significant increase in the mean practice score from 4.80 to 8.17 after the intervention, with a mean practice gain of 3.37. This improvement was statistically significant with a p-value of 0.001. In contrast, the control group showed

a small increase in the mean practice score from 4.63 to 5.00, with a mean practice gain of 0.37, which was not statistically significant ($p = 0.06$). This indicates that the nurse-led cervical cancer prevention program was effective in improving the practice scores among the women in the experiment group.

DISCUSSION

The study aimed to see if a nurse-led program could improve knowledge and practice about cervical cancer prevention among women. The findings revealed that the program was extremely effective for the women in the experimental group. Initially, both the experimental and control groups had low scores in knowledge and practice. However, following the intervention, the experimental group exhibited a substantial enhancement in both aspects. Notably, the mean knowledge score for the experimental group rose from 9.33 to 15.40, whereas the control group experienced only a minor increase from 9.53 to 10.07. Similarly, the practice scores for the experimental group rose notably from 4.80 to 8.17, whereas the control group's scores improved marginally from 4.63 to 5.00. These changes were statistically significant, highlighting the meaningful impact of the nurse-led program. The demographic data revealed that both groups were similar in most characteristics, including age, education, and marital status; however, a higher number of women in the control group reported a history of reproductive tract infections. Despite these differences, the intervention was still highly effective in the experiment group. This study highlights the importance of nurse-led educational programs in increasing awareness and improving health practices among women, especially in preventing cervical cancer [9–11].

CONCLUSION

The nurse-led cervical cancer prevention program significantly improved knowledge and practice among women in the experimental group. Before the intervention, both groups had low scores, but after the program, the experimental group showed marked improvements in both areas, while the control group did not. This clearly demonstrates that targeted educational programs can effectively boost awareness and practices related to cervical cancer prevention, benefiting women's health in the community.

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