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Effectiveness of Laptop Assisted Teaching about Cervical Cancer on Knowledge and Screening Behaviour Among Women in the Selected Rural Areas

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ABSTRACT

Cervical cancer remains one of the leading causes of cancer-related deaths among women in low-resource settings, primarily due to lack of awareness and inadequate screening. This study aimed to evaluate the effectiveness of laptop-assisted teaching in improving knowledge and screening behaviour regarding cervical cancer among women in selected rural areas of Puducherry. **Methods:** A randomized controlled trial was conducted among 60 women aged 35–55 years from the rural villages of Periakalapet and Pillaichavady. Participants were randomly assigned to an experimental group (n=30) and a control group (n=30). The intervention group received a structured laptop-assisted teaching session, while the control group received no intervention during the study period. Pre- and post-test assessments were conducted using a validated structured interview schedule measuring knowledge and screening behaviour. Data were analyzed using descriptive and inferential statistics, including paired and independent *t*-tests and chi-square tests. **Results:** Post-intervention, the experimental group showed a significant increase in mean knowledge scores (from 6.17 ± 2.74 to 17.60 ± 2.11; $t = 21.617$, $p = 0.0005$) and screening behaviour scores (from 10.03 ± 7.22 to 41.37 ± 5.10; $t = 23.335$, $p = 0.0005$). In contrast, the control group showed no significant improvement in knowledge ($p = 0.778$) or screening behaviour ($p = 0.050$). Moreover, 73.33% of women in the experimental group demonstrated adequate knowledge and 86.67% engaged in desirable screening practices post-intervention, compared to none at baseline. **Conclusion:** Laptop-assisted teaching was highly effective in improving both knowledge and screening behaviour related to cervical cancer among rural women.

Keywords: *Cervical cancer, laptop-assisted teaching, rural women*

INTRODUCTION

The role of laptop-assisted teaching in improving knowledge and screening behaviors related to cervical cancer among women, particularly in rural areas, highlights significant findings across various studies. Enhanced educational interventions such as multimedia presentations delivered through laptops have shown potential in promoting awareness about cervical cancer, a crucial step in improving screening practices in underserved populations.

Educational strategies implemented in various settings demonstrate that when effective health teaching programs are introduced, particularly those integrating technology, women's knowledge about cervical cancer increases significantly. For instance, a study in Kuwait revealed that targeted health education programs could enhance understanding of cervical cancer and its associated screening processes among women (Malibari, 2018). Furthermore, other studies indicate that multimedia health education programs significantly improved knowledge and awareness regarding cervical cancer screening among women in various rural contexts, leading to increased uptake of screening services (Liu et al., 2017; (Zhang et al., 2022). A systematic review emphasizes that educational interventions specifically designed for rural populations are vital for promoting cervical cancer screening behavior, thereby highlighting the importance of community involvement and healthcare professional-driven initiatives (Zhang et al., 2022).

Moreover, research indicates that the utilization of technology, including SMS and multimedia tools, can improve women's understanding of cervical cancer prevention, resulting in higher intentions and behaviors regarding screening (Ciceron et al., 2022). A relevant aspect is the relationship between comprehensive knowledge of cervical cancer and women's attitudes towards screening. For instance, women in Ethiopia with a higher level of understanding regarding cervical cancer were found to be three times more likely to have a favorable attitude towards screening services compared to those with lesser knowledge (Geremew et al., 2018).

In rural India, community-based health education interventions have positively influenced cervical cancer awareness and behaviors (Thahirabanuibrahim & Muthunarayanan, 2021). Additionally, a study involving healthcare workers in Nepal revealed that knowledgeable providers significantly enhance awareness and screening uptake among women (Bishnu & Pokhrel, 2022). This underscores the critical need for healthcare professionals to receive adequate training and resources to disseminate correct information effectively.

Another pertinent finding is the importance of considering socio-cultural factors affecting women's perceptions of their susceptibility to cervical cancer. Research suggests that negative perceptions and lack of knowledge can serve as barriers to screening (Williams et al., 2015), highlighting that education must be culturally relevant and accessible. Effective awareness campaigns delivered through diverse channels can foster greater knowledge and improve cervical cancer screening practices among women (Mabelele et al., 2018).

AIM OF THE STUDY

The aim of the study to evaluate the effectiveness of laptop assisted teaching about cervical cancer on knowledge and screening behaviour among women in the selected rural areas.

MATERIAL AND METHODS

Study Design and Participants

This study was conducted to evaluate the effectiveness of laptop-assisted teaching on the knowledge and screening behaviour of cervical cancer among women in selected rural areas of Puducherry. A quantitative research approach was adopted, and the study employed a randomized controlled trial (RCT) design with pre-test and post-test assessments. The study was carried out in the rural villages of Periakalapet and Pillaichavady, both under the jurisdiction of the Kalapet Primary Health Centre, Puducherry. The total sample consisted of 60 women between the ages of 35 and 55 years, who were selected using a simple random sampling technique with the lottery method. Participants were randomly assigned into two groups: 30 in the experimental group and 30 in the control group. The inclusion criteria comprised married women aged 35–55 years who could understand either Tamil or English, had given birth to at least one child, and were willing to participate. Women were excluded if they had been diagnosed with cervical cancer, had undergone a hysterectomy, were currently ill, or were nulliparous. The structured interview schedule used for data collection included three parts: demographic details, a knowledge questionnaire with 20 multiple-choice questions on cervical cancer, and a 15-item Likert scale assessing screening behaviour.

Ethical Considerations

Ethical approval for the study was obtained from the Institutional Ethics Committee. The researcher ensured that each participant received a full explanation of the study's purpose, procedures, and potential benefits. Both oral and written consent were obtained prior to data collection. The principles of confidentiality, voluntary participation, and the right to withdraw without penalty were strictly upheld throughout the study. Participants were also informed that the data would be used solely for research purposes. The researcher maintained a non-intrusive, respectful approach during interviews, and all communications were conducted in Tamil, the local language, to ensure clarity and comfort.

Intervention

The educational intervention comprised a structured laptop-assisted teaching program focused on cervical cancer. This included comprehensive content on the definition, causes, risk factors, symptoms, diagnostic tests, treatment options, prevention strategies, and possible complications associated with cervical cancer. The teaching was delivered through a lecture-cum-discussion method using a laptop with visual aids, including images, slides, and videos to enhance engagement and understanding. For the experimental group, the teaching session was conducted in small groups of five participants each, held in a quiet room within a participant’s house. Each session lasted approximately 1 hour and 30 minutes. The control group did not receive the intervention during the initial phase but was provided the same session after the completion of post-test assessments.

Data Collection Procedure

Data collection took place over a period of four weeks, from 12 January 2012 to 12 February 2012. The experimental group was drawn from Periakalapet, while the control group was selected from Pillaichavady to prevent cross-contamination. The data collection was conducted in three phases. In Phase I, a household survey was undertaken to identify eligible women who met the inclusion criteria. Participants were randomly selected and underwent a pre-test that involved administering the knowledge questionnaire and the screening behaviour scale. In Phase II, laptop-assisted teaching was provided to the experimental group. Participants were divided into smaller groups, and sessions were held in home settings to maintain familiarity and comfort. Phase III involved conducting the post-test for both experimental and control groups. The post-test for the experimental group was conducted five days after the intervention using the same tools as the pre-test. The control group received the teaching intervention only after their post-test was completed. The instrument's validity was confirmed

by a panel of subject matter experts, and reliability was established through a test-retest method, yielding a correlation coefficient of 0.8. A pilot study was conducted in two non-study villages to test the feasibility and practicality of the tool and procedure, and no modifications were found necessary.

Data Analysis

The collected data were entered and analyzed using appropriate statistical techniques. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to describe the demographic characteristics and summarize responses. Inferential statistics were applied to evaluate the impact of the intervention. Paired t-tests were conducted to compare the pre-test and post-test scores within each group. Independent t-tests were used to compare the experimental and control groups. Chi-square tests were employed to examine the association between demographic characteristics and participants' knowledge and screening behaviours. Additionally, Pearson correlation coefficients were calculated to determine the relationship between knowledge and screening behaviour scores. A p-value of less than 0.05 was considered statistically significant for all analyses.

RESULTS

Level of Knowledge:

Before the intervention, 86.67% of women in the experimental group had inadequate knowledge, which improved dramatically post-intervention with 73.33% achieving adequate knowledge. Conversely, the control group showed no improvement, with all participants still in the "inadequate" category after the post-test. (Table 1)

Screening Behaviour:

In the experimental group, desirable screening practices increased from 0% in the pre-test to 86.67% in the post-test. In contrast, the control group showed no change, with 90% of participants continuing to exhibit undesirable practices post-test. (Table 2)

Experimental Group Comparison:

The mean knowledge score increased significantly from 6.17 to 17.60 (mean difference = 11.43, $t = 21.617$, $p = 0.0005$). Similarly, the screening behaviour score improved from 10.03 to 41.37 (mean difference = 31.34, $t = 23.335$, $p = 0.0005$), indicating the intervention's strong effectiveness. (Table 3)

Control Group Comparison:

There was no significant change in knowledge (mean difference = 0.06, $p = 0.778$) or screening behaviour (mean difference = 1.34, $p = 0.050$) in the control group, suggesting that without intervention, the knowledge and practices remained unchanged. (Table 4)

Table 1 – Level of Knowledge on Cervical Cancer among Women in the Experimental and Control Group

Level of Knowledge	Experimental Group Pre-test	Experimental Group Post-test	Control Group Pre-test	Control Group Post-test
Inadequate	26 (86.67%)	0 (0%)	29 (96.67%)	30 (100%)
Moderately Adequate	4 (13.33%)	4 (13.33%)	1 (3.33%)	0 (0%)
Adequate	0 (0%)	22 (73.33%)	0 (0%)	0 (0%)

Table 2 –Level of Screening Behaviour on Cervical Cancer among Women in the Experimental and Control Group

Screening Behaviour	Experimental Group Pre-test	Experimental Group Post-test	Control Group Pre-test	Control Group Post-test
Undesirable Practice	24 (80.0%)	0 (0%)	27 (90.0%)	27 (90.0%)
Moderately Desirable	6 (20.0%)	4 (13.33%)	3 (10.0%)	3 (10.0%)
Desirable Practice	0 (0%)	26 (86.67%)	0 (0%)	0 (0%)

Table 3 – Comparison of Pretest and Posttest Level of Knowledge and Screening Behaviour in Experimental Group

Variable	Pre-test Mean ± SD	Post-test Mean ± SD	Mean Difference	t-value	p-value
Level of Knowledge	6.17 ± 2.74	17.60 ± 2.11	11.43	21.617***	0.0005
Screening Behaviour	10.03 ± 7.22	41.37 ± 5.10	31.34	23.335***	0.0005

***p < 0.001, S – Significant

Table 4 – Comparison of Pretest and Posttest Level of Knowledge and Screening Behaviour in Control Group

Variable	Pre-test Mean ± SD	Post-test Mean ± SD	Mean Difference	t-value	p-value
Level of Knowledge	3.87 ± 2.13	3.93 ± 1.80	0.06	-0.284	0.778 N.S
Screening Behaviour	9.03 ± 6.98	10.37 ± 7.01	1.34	-2.048***	0.050 N.S

N.S – Not Significant

DISCUSSION

The significant findings from the study assessing the impact of laptop-assisted teaching on cervical cancer awareness and screening behavior among women in rural areas of Puducherry are consistent with existing literature highlighting the effectiveness of targeted health education interventions. The experimental group's increase in knowledge scores—from a mean of 6.17 to 17.60—demonstrates not only the immediate impact of the educational initiative but also reflects an essential change in awareness about cervical cancer and its prevention strategies. This finding aligns with Barrow

et al., which noted that educational level strongly correlates with increased awareness of cervical cancer Barrow et al. (2020). By integrating technology into health education, the present study reinforces how modern tools can enhance learning outcomes, as highlighted by Li et al., who discussed how various health education interventions positively influence women's participation in screening programs (Li et al., 2019).

Furthermore, the substantial rise in screening behavior scores from 10.03 to 41.37 in the experimental group ($p = 0.0005$) emphasizes a transformative effect; this aligns with Sambath and Chandrasekaran's findings where health education proved critical in motivating women to engage in cervical cancer screening (Sambath & Chandrasekaran, 2018). The data indicates that a large percentage of women achieved desirable screening behavior post-intervention (86.67%), a stark contrast to baseline figures, signaling not just an increase in knowledge but a direct translation into actionable health behaviors. This is supported by findings from Lyimo and Beran, which indicate that enhancements in health literacy directly correlate with improved health-seeking behaviors (Lyimo & Beran, 2012).

The absence of similar improvements in the control group underscores the effectiveness of the laptop-assisted teaching method employed in the experimental group. While the control group demonstrated stable knowledge and marginal changes in screening behavior, no statistically significant progress was observed ($p = 0.778$). Such a stark difference illuminates the potential of educational technology to fill gaps in health awareness, particularly in rural settings where access to information and resources is limited (Moshi et al., 2018). Moreover, Shete et al. suggest that women in rural areas often face significant barriers to accessing health information, which can hinder their health-seeking behaviors (Shete et al., 2021). The effects observed in the experimental group point to the critical role that structured educational interventions can play in overcoming these barriers.

Additionally, the findings regarding the socio-cultural implications of cervical cancer awareness and screening behaviors are corroborated by Liu et al., indicating that demographic factors, such as education level and community support, are influential in promoting health behaviors among women in rural settings (Liu et al., 2017). Tailored health campaigns that involve community leaders and address specific cultural nuances have been shown to enhance overall awareness and participation in health initiatives, as noted by Asthana and Labani (Asthana & Labani, 2017).

CONCLUSION

In conclusion, the management of PCOS must employ a comprehensive and individualized strategy that incorporates dietary modifications, nutritional supplementation, exercise, psychological therapies, and possibly pharmacological treatments. As research continues to elucidate the complex interrelations between diet, lifestyle, and the metabolic challenges associated with PCOS, future directions in clinical practice should emphasize a holistic approach that supports women's health across physical, emotional, and reproductive dimensions.

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