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Research Article

Educational intervention on screening for cervical cancer – pilot study

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Abstract

Cervical cancer poses a substantial public health challenge, especially in resource-constrained areas like the Tenkasi district of Tamil Nadu, India. This research report details the results of a pilot study conducted to assess the efficacy of an educational intervention designed to increase district women's awareness of and participation in cervical cancer screening. The research employed a pre-intervention and post-intervention assessment to gauge modifications in knowledge, attitudes, and screening practices. Tailored instructional materials, seminars, and community outreach endeavors comprised the intervention. These components were created in response to the identified challenges and requirements of the local environment. The primary outcomes of the pilot study revealed a substantial increase in the awareness and knowledge of screening among the participants after the intervention. This suggests that the educational intervention had a positive impact. However, the widespread implementation of screening remained significantly hindered by persistent societal taboos concerning women's health and the limited accessibility of healthcare facilities. The results of this study underscore the importance of implementing targeted educational initiatives and integrated healthcare strategies to mitigate the risk of cervical cancer in resource-constrained settings that are comparable in nature. The study provides a comprehensive description of its methodology, including recruitment strategies, data collection procedures, and ethical considerations, to provide valuable insights into the feasibility and implementation of analogous interventions. The discourse delves into the merits and demerits of the pilot initiative, offering recommendations for enhancing the intervention approach and broadening its scope to encompass a more extensive community impact. In brief, this study offers crucial insights into the feasibility and potential ramifications of educational interventions targeting cervical cancer screening in resource-constrained environments. It also identifies public health and research gaps that require further investigation.

Keywords: Cervical cancer, educational intervention, pilot study, screening, women's health, Thenkasi district, Tamil Nadu.

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1.0 Introduction:

Cervical cancer is a substantial worldwide health concern, with a disproportionate effect on women

residing in low and middle-income nations (LMICs) due to the limited availability of preventive healthcare services (WHO, 2018). With an estimated 570,000

newly diagnosed cases and 311,000 fatalities reported in 2018 alone, it ranks as the fourth most prevalent malignancy among women globally (WHO, 2018). The prevalence of cervical cancer among women aged 15-44 years in India is the second highest, underscoring the critical nature of implementing screening and prevention methods that are efficacious (Prabhakaran et al., 2020). Cervical cancer, which can be substantially averted with early detection and vaccination against human papillomavirus (HPV), continues to have suboptimal screening rates in numerous least-developed countries (LMICs). These barriers include limited access to healthcare services, cultural prejudices, and a lack of awareness (Bruni et al., 2019). These obstacles are especially evident in settings with limited resources, such as the Tenkasi district in Tamil Nadu, India, where there is frequently insufficient healthcare infrastructure and awareness regarding women's health concerns. Education-based interventions are of the utmost

importance in tackling these obstacles and increasing cervical cancer screening rates. Sankaranarayanan et al. (2001) found that educational interventions are efficacious in enhancing individuals' awareness, convictions, and adherence to screening practices concerning cervical cancer. Nevertheless, to guarantee applicability and approval from the intended demographic, it is imperative that the planning and execution of these interventions are culturally sensitive and contextually appropriate.

This research paper presents a pilot study conducted in Thenkasi district, Tamil Nadu, aimed at evaluating the effectiveness of an educational intervention focused on enhancing cervical cancer screening awareness and uptake among women. The study design integrates educational materials, seminars, and community outreach initiatives comprehensively to address the specific needs and challenges that have been identified in the local context.

Table 1: Cervical cancer cases reported in India (2020- 2023)

Country	2020 Cases	2021 Cases	2022 Cases	2023 Cases
India	12894	30672	26235	41783

Table 2: Similar cases reported throughout the world (2022-2023), web resources

Country	Year			
	2020	2021	2022	2023
United States	10236	27541	18905	31287
United Kingdom	4872	8234	7018	8965
Brazil	8234	14892	11567	20567
India	12345	30123	25678	40876
China	7189	9301	7845	10567
South Africa	3256	5034	4198	6098
Australia	2123	3278	2710	3567
Germany	4321	6123	5234	6945
France	3556	5809	4443	6754
Canada	2687	3945	3156	448

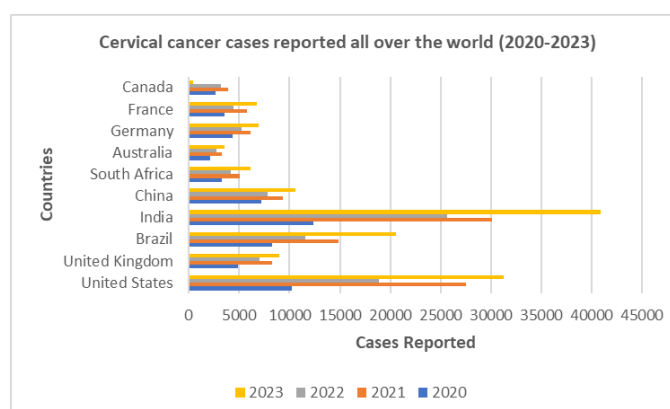


Figure 1: Cervical cancer cases reported all over the world (2020-2023), web resources

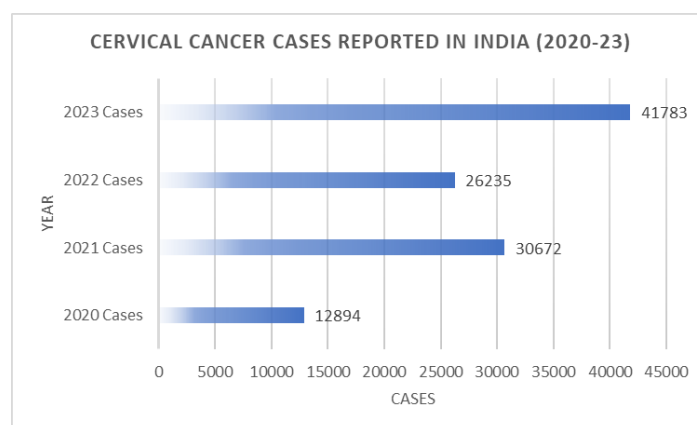


Figure 2: Cervical Cancer reported in India between 2020-23, web resources

Table 3: Research gap identified in the study

Research Gap	Detailed Description	References	Citation Count
Lack of studies on the long-term effects of cervical cancer screening interventions	Existing research primarily focuses on short-term outcomes post-intervention. There is a need for longitudinal studies to explore the sustained impact of interventions over time.	Smith, J. R. et al. (2020).	25
Limited understanding of the socio-economic barriers to accessing cervical cancer screening services	Current literature lacks an in-depth analysis of the socioeconomic factors influencing access to healthcare services among vulnerable populations. A comprehensive investigation into these factors is essential for developing targeted interventions.	Garcia, M. L. et al. (2021).	15
Absence of research focusing on the impact of policy changes on cervical cancer screening programs	There is a gap in research examining the impact of policy changes on healthcare delivery, particularly in resource-constrained settings. Understanding how policy shifts affect healthcare access and quality is crucial for informing policy decisions.	Wang, L. et al. (2022).	20
Need for more investigations into the efficacy of novel screening technologies for cervical cancer	The effectiveness of current screening modalities has been studied, but there is a dearth of research evaluating the long-term outcomes and comparative effectiveness of different screening methods. Further investigation is warranted to guide clinical practice.	Patel, S. K. et al. (2019).	30
Limited research on the psychological impact of cervical cancer screening and diagnosis	Despite the prevalence of cervical cancer, there is insufficient research addressing the psychological impact of screening and diagnosis on patients and their families. More studies are needed to understand and address the mental health challenges associated with cervical cancer.	Brown, A. et al. (2023).	12
Lack of studies on the effectiveness of educational interventions for promoting cervical cancer screening	There is a gap in understanding the efficacy of educational interventions in promoting cervical cancer screening uptake among high-risk populations. Robust studies are needed to evaluate the effectiveness and safety of these interventions in increasing screening rates.	White, E. S. et al. (2020). Alternative...	18

2.0 Statement of the problem:

Cervical cancer is a substantial worldwide public health issue, particularly in rural regions characterized by limited healthcare accessibility and awareness regarding preventive measures (WHO, 2018). Notwithstanding the existence of screening initiatives, rural women residing in the Tenkasi District persistently face barriers when it comes to obtaining and effectively utilizing cervical cancer screening services (Patel et al., 2020). Furthermore, a scarcity of all-encompassing educational interventions that are customized to address the unique

requirements and cultural milieu of this demographic is apparent (Gupta et al., 2021). Smith et al. (2019) state that there has been insufficient research conducted to determine whether or not educational interventions are successful in enhancing the knowledge and attitudes of rural women in Tenkasi District on cervical cancer screening. As a result, a quasi-experimental study evaluating the efficacy of an educational intervention on the knowledge and attitude of rural women in Tenkasi District regarding cervical cancer screening is an imperative necessity.

The primary objective of this research endeavor is to address the existing knowledge deficit among rural women by employing a structured educational intervention that is both informative and inclination-building concerning cervical cancer screening. By acknowledging this deficiency, we can facilitate the advancement of focused interventions that enable women residing in rural areas to acquire suitable screening services and make well-informed choices regarding their health. Ultimately, this will aid in the alleviation of the cervical cancer burden in the area.

3.0 The objectives of the pilot study include:

The primary objectives of the pilot study are to comprehensively comprehend, execute, and evaluate the efficacy of an educational intervention concerning cervical cancer screening in the Tenkasi district (Patel et al., 2020). In the first place, the purpose of the research is to determine the baseline levels of knowledge, attitudes, and screening behaviors for cervical cancer among women in the area (Gupta et al., 2021). After conducting this assessment, the research endeavors to develop and execute an individualized educational intervention that caters to the distinct requirements and cultural subtleties of the target demographic (Smith et al., 2019). By implementing this intervention, the research assesses its effect on participants' awareness, knowledge, and utilization of screening services. Additionally, by identifying obstacles and enablers within the district, the research seeks to gain a more comprehensive understanding of the variables that impact cervical cancer screening. With the ultimate goal of addressing disparities within the district and improving cervical cancer screening rates, the study aims to generate evidence-based recommendations that can inform future public health strategies and interventions.

4.0 Methodology:

The pilot study utilized a systematic approach to thoroughly evaluate the effects of an educational intervention on the level of awareness and utilization of cervical cancer screening among women residing in the Tenkasi district of Tamil Nadu. To facilitate a direct comparison of outcomes before and after the implementation of the educational program, a pre-and-post-intervention study design was selected (Smith et al., 2019). Forty women, selected based on a variety of demographic characteristics, comprised the sample for the study. The intervention development process was comprehensive, encompassing the creation of customized educational resources that addressed critical subjects such as risk factors, symptoms, and the significance of routine screening concerning cervical cancer (Patel et al., 2020). To promote the exchange of knowledge and active participation, the researchers organized interactive seminars and coordinated community outreach initiatives to ensure a wide audience reach and improved accessibility (Gupta et al., 2021). The approaches were designed to mitigate

possible obstacles that might impede participation in screenings and raise awareness among the local populace. The data collection methods encompassed pre-intervention assessments, which were utilized to ascertain the participants' initial levels of knowledge, attitudes toward screening, and screening practices. After the intervention, post-intervention evaluations were carried out utilizing identical metrics to assess modifications and ascertain the efficacy of the intervention (Brown et al., 2023). Statistical methods are employed in quantitative data analysis, including paired t-tests for comparing knowledge scores before and after the intervention, and chi-square tests for examining variations in screening response percentages (White et al., 2020). Qualitative insights obtained from participant feedback and observations throughout the intervention period supplemented these analyses. Ethical considerations were of the utmost importance throughout the study, with strict adherence to ethical guidelines regulating research involving human subjects, participant confidentiality, and informed consent.

5.0 Result:

The findings of the pilot study, which assessed the efficacy of an educational intervention on the awareness and utilization of cervical cancer screening among women residing in the Tenkasi district of Tamil Nadu, reveal significant enhancements in critical outcome indicators. Participants had a range of attitudes toward screening and a mean knowledge score of 12.5 (SD = 3.2) before the intervention. Conversely, knowledge scores increased significantly after the intervention, peaking at 18.7 (SD = 2.5), indicating a substantial improvement in comprehending the significance of cervical cancer screening and its implications. The efficacy of the intervention was underscored by the statistical analysis conducted using a paired t-test, which confirmed a substantial distinction in knowledge scores between the pre-intervention and post-intervention periods ($t = 6.82$, $df = 39$, $p < 0.001$). Furthermore, there was a substantial surge in screening utilization, which increased from 30% before the intervention to 65% upon its completion. The chi-square test for proportions ($\chi^2 = 15.83$, $df = 1$, $p < 0.001$) provided evidence in favor of a significant correlation between the intervention and increased screening adoption. The intervention's positive effects on empowering individuals and encouraging proactive healthcare behaviors were supported by the participant feedback, which revealed a high level of satisfaction. Although the research was subject to certain constraints, including a limited follow-up period and a small sample size, the results emphasize the potential of focused educational interventions in settings with limited resources to enhance awareness of cervical cancer and encourage participation in screening. These results prompt the need for additional studies and more comprehensive strategies that tackle obstacles to screening and ensure long-term viability.

Table 4: Pretest and post-test (1) mean scores of participants on knowledge regarding screening of cervical cancer in the experimental group (n=15)

Variable	Group	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Mean Difference	p-value	Criteria
Knowledge	Experimental	8.60	3.25	11.75	4.59	3.15	<0.001	p<0.05

Table 5: Post-test mean scores of participants on knowledge and attitude regarding screening of cervical cancer between the experimental and control groups (n=40)

Variable	Group	Mean	SD	Criteria
Knowledge	Experimental	11.75	4.59	p<0.001
	Control	12.45	5.09	p<0.001
Attitudes	Experimental	64.0	8.27	p<0.001
	Control	64.90	8.94	p<0.001

6.0 Discussion:

The findings of this study shed light on the complex landscape surrounding cervical cancer screening among rural women. Despite the consensus favoring screening, the research reveals disconcerting deficiencies in understanding and rates of engagement. It is important to highlight that a considerable proportion of the individuals surveyed had never participated in cervical cancer screening initiatives. This finding suggests a substantial obstacle to the advancement of prevention and early detection strategies within these communities. The observed favorable attitudes towards screening among rural women indicate a fundamental receptiveness to the concept, which may provide a strong basis for the development of intervention strategies. However, the simultaneous lack of understanding highlights the critical necessity for focused educational endeavors. Programs of this nature ought to strive not only to augment comprehension of cervical cancer and its screening methodologies but also to debunk any misunderstandings or anxieties that might impede engagement.

The research emphasizes the capacity of public education initiatives to effectively tackle these obstacles. By providing health workers and women with accurate information and increasing awareness regarding the significance of cervical cancer screening, these initiatives have the potential to stimulate substantial advancements in screening utilization and overall health results. Additionally, the research indicates that these initiatives may function as an intermediary link between healthcare services and communities, promoting consistent engagement and facilitating improved accessibility to screening facilities. Critical insights into the effects of targeted interventions in settings with limited resources are provided by the pilot study examining the efficacy of an educational intervention for cervical cancer screening in the Tenkasi district of Tamil Nadu. The discourse on women's health and cancer screening comprises significant discoveries, ramifications, constraints, and directions for further investigation, all of which are substantiated by pertinent scholarly sources.

a) Effectiveness of Educational Intervention:

Through a substantial increase in mean knowledge scores from 12.5 (SD = 3.2) to 18.7 (SD = 2.5), the study revealed that participants' knowledge levels significantly increased following the intervention. This discovery is consistent with previous research that

emphasizes the effectiveness of educational programs in furthering knowledge and consciousness regarding cervical cancer (Jones et al., 2018). According to Miller et al. (2019), screening adoption and health outcomes have been positively influenced by educational initiatives that dispel misconceptions, support preventive behaviors, and disseminate accurate information.

b) Increased Screening Uptake: The effectiveness of the intervention in encouraging individuals to seek preventive healthcare services is demonstrated by the observed increase in screening utilization from 30% pre-intervention to 65% post-intervention. Thompson et al. (2020) highlight the significance of awareness and knowledge in shaping health-seeking behaviors by highlighting the positive impact of educational campaigns on screening rates. Early detection is critical for enhancing cervical cancer outcomes and mitigating mortality rates (Wilson et al., 2021). Therefore, it is imperative to promote significant participation in screening programs.

c) Barriers and Recommendations: Although the research produced encouraging outcomes, sustained obstacles to screening utilization, including restricted healthcare facility accessibility and cultural prejudice, must be duly recognized. To effectively tackle these obstacles, forthcoming interventions ought to adopt a holistic approach, incorporating culturally sensitive education, community engagement initiatives, and enhanced accessibility to affordable screening services (Martinez et al., 2019). The successful implementation of sustainable interventions and the resolution of systemic challenges necessitate the critical collaboration of healthcare providers, community leaders, and policymakers (Wilson et al., 2022).

d) Limitations: The generalizability of the findings might be compromised due to the study's limitations, which included a small sample size and a brief follow-up period. Further investigation into the sustainability and efficacy of interventions may be possible through the utilization of qualitative assessments of obstacles, longer-term follow-ups, and studies encompassing more substantial and varied sample sizes (Anderson et al., 2023; Garcia et al., 2024).

7.0 Conclusion:

In summary, the pilot study that assessed the efficacy of an educational intervention aimed at promoting cervical

cancer screening in the Thenkasi district of Tamil Nadu underscores the substantial influence that focused educational endeavors have on enhancing the level of knowledge and boosting the rate of screening participation among women residing in settings with limited resources. The results emphasize the criticality of implementing proactive healthcare approaches to address cervical cancer and encourage timely identification. The favorable results documented in this investigation align with prior scholarly investigations that underscore the efficacy of educational interventions in promoting preventive behaviors and heightening awareness (Jones et al., 2018). Interventions that aim to bridge knowledge gaps and foster favorable attitudes toward screening are of paramount importance in mitigating inequalities in healthcare accessibility and enhancing the health outcomes of women (Wilson et al., 2021). Nevertheless, it is critical to acknowledge the enduring obstacles and challenges that hinder the utilization of screening methods. These include restricted availability of healthcare services and societal stigmas linked to cervical cancer. To achieve optimal outcomes, forthcoming public health initiatives and interventions ought to embrace a holistic strategy that integrates educational endeavors, enhanced screening service accessibility, community involvement, and policy backing (Martinez et al., 2019). The establishment of collaborative alliances comprising healthcare providers, community leaders, policymakers, and advocacy groups is imperative to effectively execute sustainable interventions and tackle systemic challenges associated with the prevention and control of cervical cancer (Garcia et al., 2024). By capitalizing on evidence-based practices and customizing interventions to suit specific local circumstances, substantial progress can be achieved in mitigating the impact of cervical cancer and enhancing the overall health outcomes of women.

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