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A Study To Assess The Effectiveness Of Self Instructional Booklet On Knowledge And Attitude Regarding The Human Papilloma Virus Vaccine Among School Students In Selected Schools Of Bhopal M.P.

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Abstract: This study evaluates the impact of a self-instructional on knowledge and attitudes towards the Human Papilloma Virus (HPV) vaccine among school students in Bhopal, India. Recognizing HPV a leading cause of cervical cancer mortality in women, the study aims to bridge the knowledge gap related vaccination amongst adolescents. A quantitative pre-experimental design was utilized, involving 200 students (ages915) who pre- and post-test following the intervention. Results indicated a significant increase knowledge scores (from 11.2 to 21.96, p < .) and a shift in attitudes, with % of participants achieving an adequate attitude post-intervention. Notably, demographic factors such as place of residence significant correlations with baseline scores. The findings endorse the self-instructional booklet an effective tool for improving vaccine, highlighting its for integration into health curricula for cervical cancer.

Keywords: HPV Vaccine, Cervical Cancer, Self-Instructional Booklet, School Students, Knowledge, Attitude, Bhopal

Introduction

Human Papilloma virus (HPV) is a significant etiological factor in the development of various epithelial lesions and malignancies, predominantly affecting cutaneous and mucosal surfaces. With over 100 identified subtypes, HPV infection poses a substantial public health concern, particularly among individuals with persistent infections or multiple sexual partners, who are at an elevated risk of acquiring additional HPV strains. Persistent infection with Human papillomavirus (HPV) is a well-established etiological factor in the development of multiple epithelial malignancies and premalignant lesions. The prophylactic HPV vaccine has been developed to provide immunity against the most prevalent high-risk and low-risk viral subtypes responsible for genital warts, precancerous lesions, and cancers of the cervix, vagina, vulva, anus, penis, and oropharynx. HPV primarily infects the basal layer of the epithelium, where most infections remain transient and are cleared spontaneously within one to two years; however, persistent infection with oncogenic HPV types represents the most significant risk factor for carcinogenesis, particularly in cervical cancer. In women, cervical squamous intraepithelial lesions (SIL) detected through screening are classified as low-grade squamous intraepithelial lesions (LSIL), which frequently regress, and high-grade squamous intraepithelial lesions (HSIL), which are considered direct precursors to invasive

carcinoma. These lesions, previously termed cervical intraepithelial neoplasia (CIN), may progress to malignancy if not identified and managed appropriately. Similar precursor lesions, including anal HSIL, vulvar HSIL, and vaginal HSIL, play a critical role in the pathogenesis of anogenital cancers. Infection with one HPV subtype does not confer cross-protection against other subtypes, and co-infection with multiple HPV strains occurs in a substantial proportion of individuals with mucosal HPV infection. Therefore, understanding the natural history of HPV infection, persistence, and co-infection dynamics is essential for strengthening vaccination strategies, screening programs, and early therapeutic interventions aimed at reducing HPV-related cancer burden.

Review of literature:-

Cancer continues to represent a major global public health challenge, accounting for substantial morbidity and mortality worldwide. According to the **World Health Organization**, approximately 9.6 million deaths were attributed to cancer in 2018, with projections estimating an increase to 13.1 million deaths by 2030, highlighting the urgent need for effective preventive and early detection strategies. Cancer, the second leading cause of death globally, remains associated with inadequate public awareness regarding risk factors, screening methods, and preventive measures despite advancements in medical science. In India, cervical cancer, breast cancer, and cancers of the upper aerodigestive tract contribute significantly to the national cancer burden, with delayed diagnosis often linked to insufficient knowledge about screening techniques such as Visual Inspection with Acetic Acid (VIA) and Visual Inspection with Lugol's Iodine (VILI). Cancer risk factors are broadly categorized into modifiable factors, including tobacco use, alcohol consumption, unhealthy diet, physical inactivity, and unsafe sexual practices, and non-modifiable factors such as age and genetic predisposition. Persistent infection with **Human papillomavirus** is a major etiological factor for cervical cancer, and prophylactic HPV vaccination, along with safe sexual practices, plays a crucial role in prevention. Community-based awareness programs and population-based screening initiatives have demonstrated effectiveness in reducing cancer-related mortality; however, lack of awareness, limited accessibility, and sociocultural barriers continue to hinder their implementation, particularly in developing countries. Evidence from recent studies supports the effectiveness of educational interventions in improving knowledge and preventive behavior related to cervical cancer. Deorukhkar et al. (2022) reported a significant increase in knowledge scores among women following the use of a self-instructional module on cervical cancer prevention, indicating the usefulness of structured educational materials in hospital settings. Similarly, Thiel de Bocanegra et al. (2022) found that a tablet-based educational tool significantly improved young women's understanding of HPV infection and cervical cancer screening recommendations compared with routine counseling. Furthermore, a systematic review by Zhang (2022) concluded that educational interventions are essential in increasing cervical cancer screening uptake, particularly among rural populations where awareness levels are low. Collectively, these findings emphasize that strengthening health education, vaccination, and screening programs is essential for reducing the burden of cervical cancer and other preventable malignancies, especially in resource-limited settings.

RESEARCH METHODOLOGY:-

The present study adopted a quantitative evaluative research approach to assess the effectiveness of a self-instructional booklet on knowledge and attitude regarding the Human papillomavirus vaccine among school students. A pre-experimental one-group pre-test post-test research design was employed to measure the change in participants' knowledge and attitude before and after the educational intervention. In this design, baseline data were collected using a structured pre-test to evaluate the existing level of knowledge and attitude related to the HPV vaccine, followed by the administration of the intervention in the form of a self-instructional booklet. After a specified interval, a post-test was conducted using the same tool to determine the effectiveness of the intervention by comparing pre-test and post-test scores.

3.1Population and Sample

A **non-probability purposive sampling technique** was employed to select the study setting and participants based on predefined eligibility criteria and willingness to participate in the study. The study was carried out in selected higher secondary schools, namely Shri Satyasai Higher Secondary School and Pragatishil Higher Secondary School, located in Bhopal. These settings were chosen to obtain an appropriate sample of school students for evaluating the effectiveness of the educational material regarding HPV vaccination.School students who met the inclusion criteria were recruited from the selected schools. The inclusion criteria comprised students who were willing to participate, present during the period of data collection, and studying in classes considered appropriate for awareness regarding the **Human papillomavirus vaccine**, typically corresponding to early adolescence (around 15 years of age). Students who had previously received formal education or orientation regarding the HPV vaccine and those who were absent during either the pre-test or post-test sessions were excluded from the study to maintain uniformity of exposure to the intervention.

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3.2 Data and Sources of Data

Data were collected using a **structured self-administered questionnaire** developed by the investigator to assess the knowledge and attitude of students regarding the HPV vaccine. The instrument consisted of three sections: the first section included demographic variables such as age, gender, class, and prior knowledge regarding the HPV vaccine; the second section comprised multiple-choice questions designed to assess knowledge related to HPV infection and vaccination; and the third section consisted of an attitude scale based on a Likert format to evaluate students' attitudes toward HPV vaccination. The content validity of the tool was established through evaluation by a panel of experts from the fields of public health, nursing, and education to ensure relevance, clarity, and adequacy of the items. The reliability of the instrument was determined using the split-half method and Cronbach's alpha coefficient to assess internal consistency, and the obtained reliability coefficient ($r = 0.9$) indicated that the tool was highly reliable for measuring knowledge and attitude regarding HPV vaccination.

3.3 Theoretical framework

3.3 Theoretical framework

A **conceptual framework** is a set of interrelated concepts and propositions that provide a systematic structure for organizing ideas and guiding research. It offers a logical framework that helps in understanding relationships among variables and provides direction for data collection, interpretation, and generalization of findings. In nursing research, a conceptual framework facilitates clarity of thought, improves communication, and ensures a structured approach to education, administration, and clinical practice. The present study was guided by **Imogene King's Goal Attainment Theory**, which views the human being as an open and dynamic system continuously interacting with the environment. According to King, goal attainment occurs through interpersonal interactions between individuals, particularly in situations where two people, often strangers, come together in a health-related setting to maintain or improve health through mutual understanding and communication.

The major concepts of King's theory include **interaction, perception, communication, transaction, role, stress, growth and development, time, and space**, all of which are interrelated in every nursing situation. In the present study, these concepts were applied to explain the effectiveness of a self-instructional booklet on knowledge and attitude regarding the **Human papillomavirus vaccine** among school students. *Interaction* refers to the mutual relationship between the investigator and the students during the educational intervention. *Perception* involves the investigator's recognition of the learning needs of students regarding HPV vaccination. *Communication* occurs through the administration of the structured questionnaire and the distribution of the self-instructional booklet to provide information. *Transaction* is reflected in the observable change in students' knowledge and attitude after receiving the educational material. *Role* refers to the expected behavior of students as learners who gain awareness about HPV prevention and vaccination. *Stress* represents the dynamic state in which students adapt to new information to maintain balance and improve understanding. *Growth and development* indicate the progressive improvement in knowledge and attitude achieved through learning. *Time* denotes the sequence of events from pre-test to intervention and post-test, while *space* refers to the specific educational setting in which behavioral change occurs. Thus, **Goal Attainment Theory provided an appropriate theoretical basis for explaining how structured educational intervention can influence knowledge and attitude change among school students regarding HPV vaccination.**

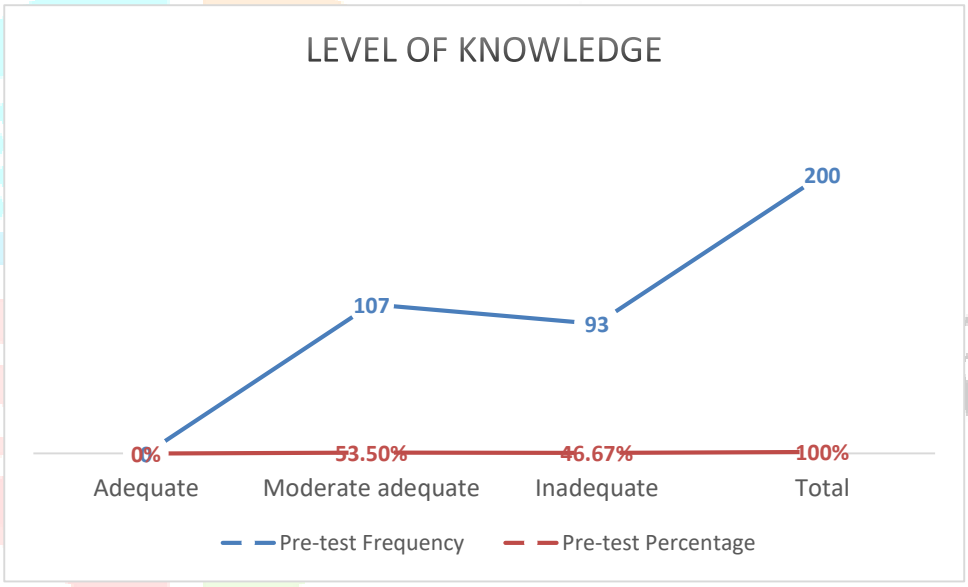
3.4Statistical tools and econometric models

Section-B: Assess the pre-test level of knowledge regarding the HPV vaccine.

Table 4.2.1: Frequency and percentage distribution of pre-test level of knowledge regarding the HPV vaccine.

N=200

Level of knowledge	Pre-test	
	Frequency	Percentage
Adequate	0	0%
Moderate adequate	107	53.5%
Inadequate	93	46.67%
Total	200	100%



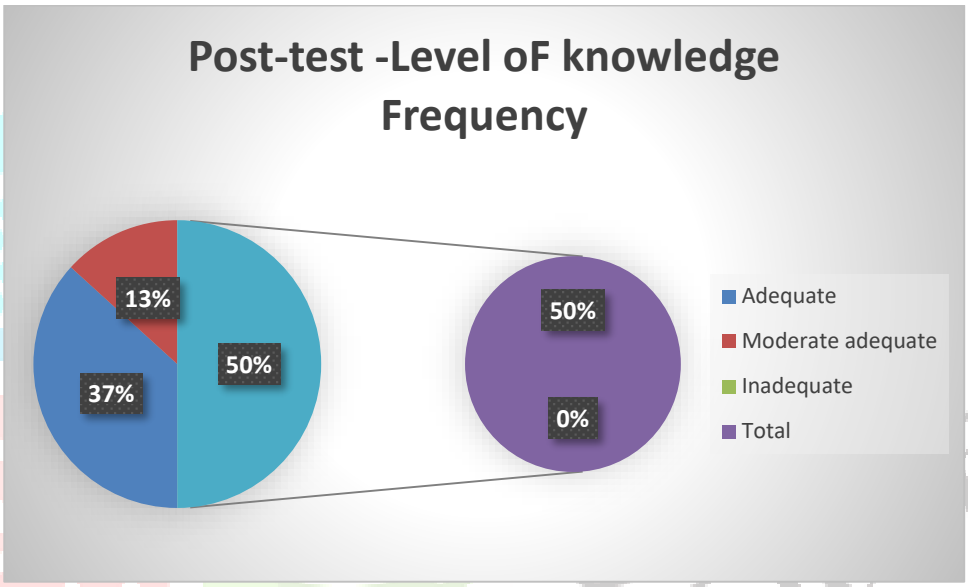
Graph 4.2.1 Percentage distribution of pre-test level of knowledge among school students.

Table 4.2.1 and graph 4.2.1. Shows distribution of subjects according to level of knowledge regarding the HPV vaccine among school students 0% (n=0) had adequate knowledge, 46.67% (n=93) had inadequate knowledge and remaining 53.5% (n=107) had moderate adequate knowledge.

Section-C Assess the post–test level of knowledge regarding the HPV vaccine.

Table 4.3.1: Frequency and percentage distribution of respondents on post-test knowledge level on the HPV vaccine.

Level o knowledge	Post-test	
	Frequency	Percentage
Adequate	147	73.5%
Moderate adequate	53	26.5%
Inadequate	0	0%
Total	200	100%



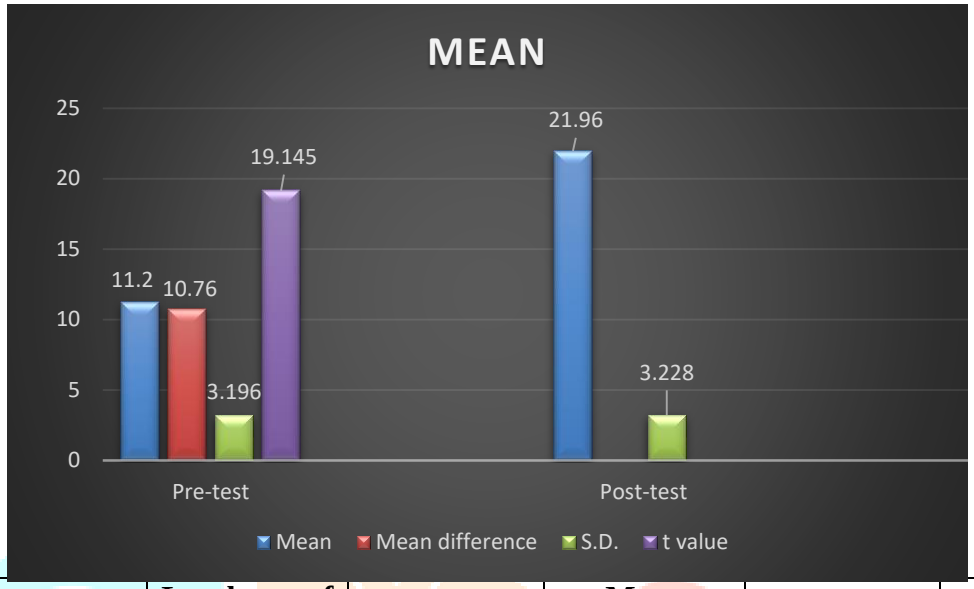
Graph 4.3.1: Percentage distribution of respondents on post-test knowledge level on the HPV vaccine.

Table 4.3.1 graph 4.3.1 Shows distribution of subjects according to level of knowledge regarding the HPV vaccine among school going children 53(26%) have moderate adequate knowledge, 147(73.5%) have adequate knowledge and none of them have inadequate knowledge after the self-instructional booklet.

Section A: Effectiveness of self-instructional booklet on knowledge regarding the HPV vaccine among school students.

Table 4.4.1: Comparison of mean, mean difference, and standard deviation of pre-test and post-test knowledge level of school students regarding the HPV vaccine.

N=200



S. No.	Level of knowledge	Mean	Mean difference	S.D.	t value
1.	Pre-test	11.2	10.76	3.196	19.145
2.	Post-test	21.96		3.228	

Table 4.4.1: depicts that the mean score of pre-test knowledge score was 11.2 and post–test knowledge score was 21.96. This indicates that there was a significant difference between pre-test and post-test knowledge scores regarding the HPV vaccine among school students at the level of 0.05 of significance, and the research hypothesis is accepted.

Section B: Association of level of pre- test level of knowledge regarding the HPV vaccine among school students with selected demographic variables.

Table 4.5.1: Association of level of pre- test level of knowledge regarding the HPV vaccine among school students with selected demographic variables.

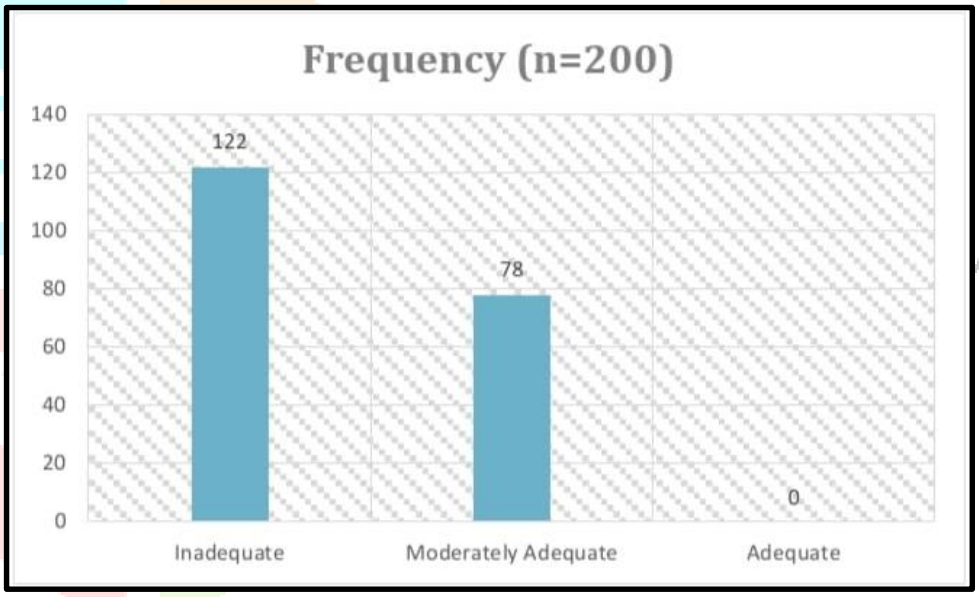
N=200

Demographic variables	Pre-test level of knowledge		DOF	X2
	Moderately	Inadequately		
1.Age in year a) 9-11 years	70	25	4	1.539 Not significant
b) 11-12 years	55	45		
c) 12-15 years	70	35		
2. Class in studying a) VI Standard	60	75	4	2.34 Not Significant
b) VII Standard	55	40		
c) VIII Standard	45	25		
3. Family income a) Below 5000	40	40	4	4.624 Not Significant
b)10,00020,000	80	50		
c)Above20,000	70	20		
4. Place of residence a) Rural	60	100	1	6.9 Significant
b) Urban	100	40		
5. Type of family a)Nuclear	110	65	9	2.768 Not Significant
b)Joint	45	65		
c)Extended	0	5		
d)Single parents	5	5		
6. Education of the parent a) Graduate	195	40	4	3.5 Not Significant
b) primary	60	25		
c) secondary	50	30		
7. source of information a) Television	60	20	4	6.83 Not Significant
b) Internet	75	55		
c) magazine	90	0		
8. Previous knowledge a)Yes	30	55	1	0.17 Not Significant
b) no	40	185		

Significant at p<0.05 level **df (1)=6.9, p<0.05level**

The table depicts that there was significant association between demographic variables such as place of residence of the HPV vaccine and there was no significant association between other demographic variables such as age, class of studying, family income, type of family, education of parents, source of information and previous knowledge of the HPV vaccine.Table 4.2.2: Pre-test Attitude Levels Regarding the HPV Vaccine

Level of Attitude	**Frequency (N=200)**	**Percentage (%)**
Inadequate	122	61.00%
Moderately Adequate	78	39.00%
Adequate	0	0.00%
Total	**200**	**100.00%**



The correlation between inadequate knowledge and Inadequate attitudes in the pre-test underscores the "information-action gap." Without understanding that the HPV vaccine does not contain a live virus and is safe for administration in young teens, the students' default psychological position is one of avoidance or apprehension.[3]

Part-1

Section C: Assessment of Post-test Levels of Knowledge and Attitude

Exposure to the self-instructional booklet catalyzed a transformative shift in both student knowledge and perspective. The post-test results indicate a dramatic rise in cognitive competence. After utilizing the booklet, 73.5% of the students achieved "Adequate" knowledge levels, and the remaining 26.5% reached "Moderately Adequate".[6] Most notably, the "Inadequate" category was entirely eliminated (0%).[6] This improvement suggests that the self-instructional format—allowing students to read and process information at their own pace—is exceptionally effective for this age group.[1]

The affective domain underwent a parallel evolution. Post-test attitude scores shifted from predominantly Inadequate to predominantly Adequate. Following the intervention, 72% of the students expressed a "Adequate" attitude toward the HPV vaccine, with the remaining 28% moving into the "Moderately Adequate" category.[3] The total elimination of "Inadequate" attitudes (0%) indicates that when the benefits of the vaccine—specifically its role in preventing life-threatening cancers—are clearly communicated, students are willing to adopt a positive health outlook.[1]

Table 4.3.1: Post-test Knowledge Levels Regarding the HPV Vaccine

Level of Knowledge	**Frequency (N=200)**	**Percentage (%)**
Inadequate	0	0.00%
Moderately Adequate	53	26.5%
Adequate	147	73.5%
Total	**200**	**100.00%**

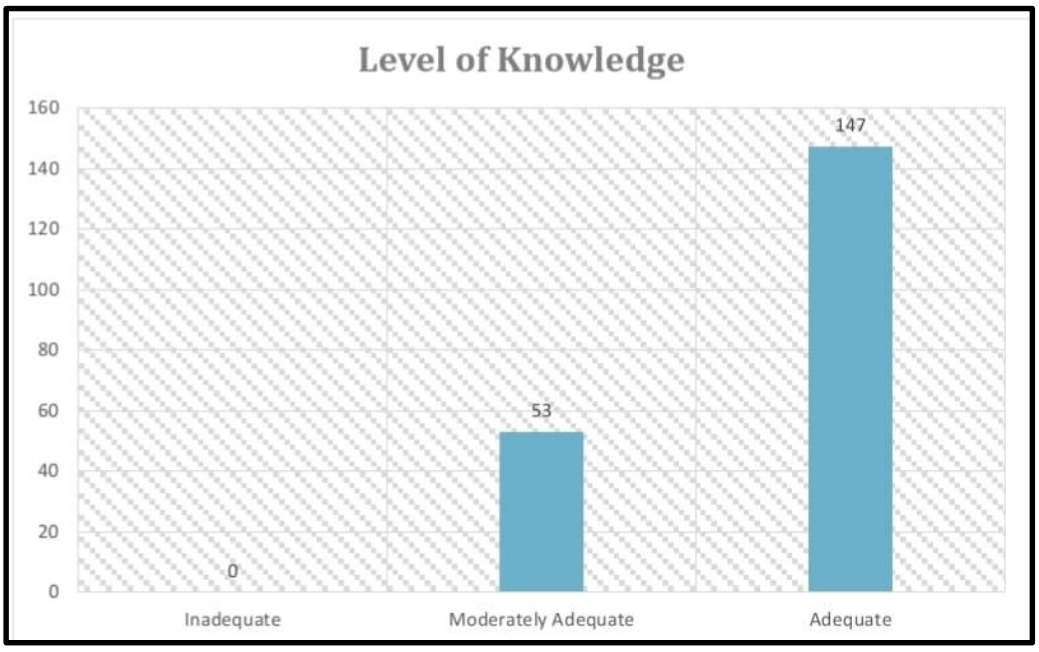
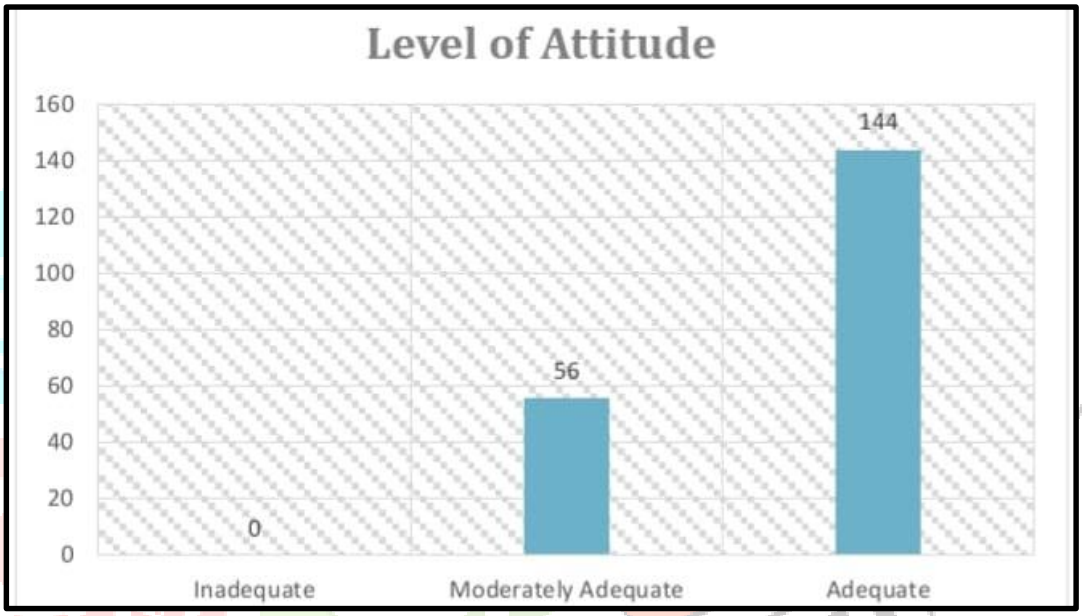


Table 4.3.2: Post-test Attitude Levels Regarding the HPV Vaccine

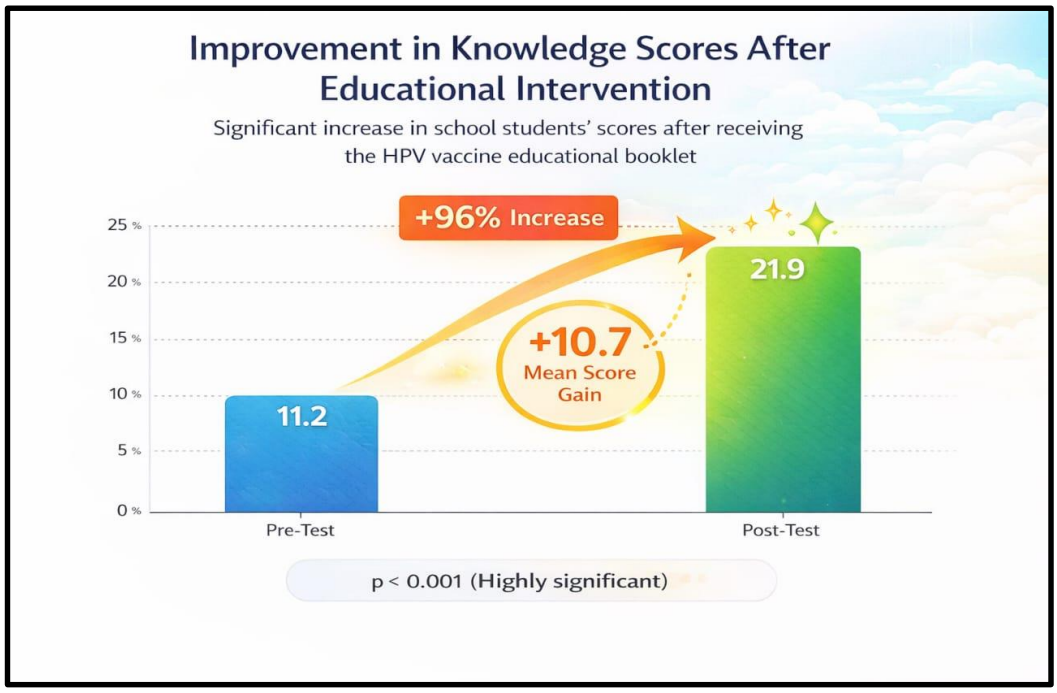
Level of Attitude	**Frequency (N=200)**	**Percentage (%)**
Inadequate	0	0.00%
Moderately Adequate	56	28.00%
Adequate	144	72.00%
Total	**200**	**100.00%**



This transition highlights the booklet's ability to act as a bridge between scientific data and personal belief systems. By detailing the clinical endpoints—such as the prevention of cervical, vaginal, and vulvar cancers—the booklet empowers students with the "why" behind the medical recommendation, thus fostering a proactive health attitude.[1]

Table 4.4.1: Comparison of Pre-test and Post-test Knowledge Scores

Test Phase	**Mean Score**	**Mean Difference**	**Standard Deviation**	**t-value**	**P-value**
Pre-test	11.20		10.76	19.145	< 0.05
Post-test	21.96	10.76	3.228		



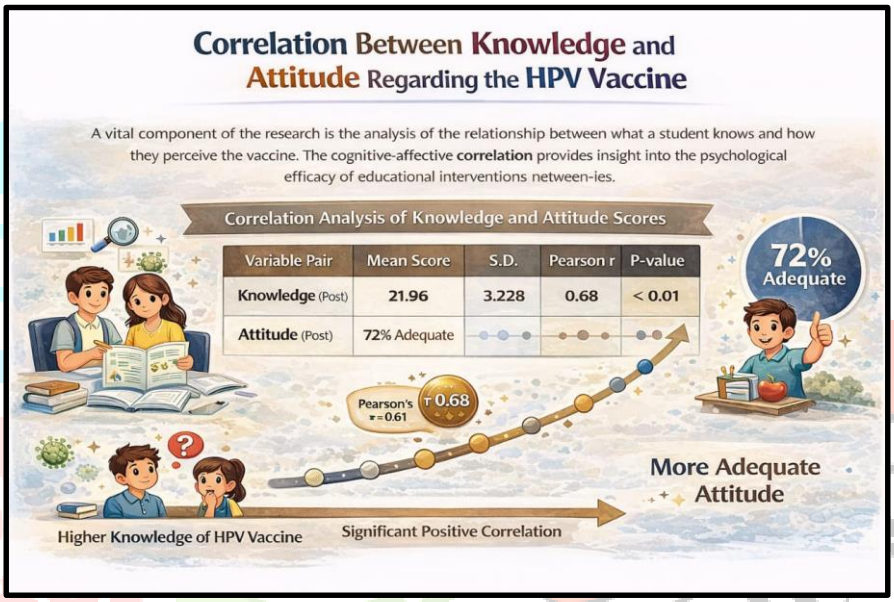
This substantial increase in scores (a mean difference of 10.76) provides robust evidence that the self-instructional booklet was a direct cause of improved understanding. The elimination of chance as a factor allows for the formal acceptance of hypothesis H1.[6] These findings are consistent with evaluative research in other Indian states, where structured modules consistently outperformed standard health instruction in terms of long-term knowledge retention.[4]Table 4.5.1: Chi-Square Association of Pre-test Knowledge with Demographics

Demographic Variable	**Category**	**Moderately**	**Inadequately**	**DF**	**X2**	**Significance**
1. Age	10-13	195	105	4	1.539	Not Sig.
2. Class	VI-VIII	160	140	4	2.340	Not Sig.
3. Income	Low-High	190	110	4	4.624	Not Sig.
4. Residence	**Rural/Urban**	**160**	**140**	**1**	**6.900**	**Significant**
5. Family Type	Nuclear/Joint	155	135	9	2.768	Not Sig.
6. Education	Graduate/Other	195	105	4	3.500	Not Sig.

7. Info Source	Web/TV/Other	225	75	4	6.830	Not Sig.
8. Prev. Know.	Yes/No	70	230	1	0.170	Not Sig.

[6]Correlation Between Knowledge and Attitude Regarding the HPV Vaccine

A vital component of the research is the analysis of the relationship between what a student knows and how they perceive the vaccine. The cognitive-affective correlation provides insight into the psychological efficacy of educational interventions.



Data analysis revealed a significant positive correlation between post-test knowledge scores and post-test attitude scores ($p < 0.01$). This indicates that as a student's factual understanding of the HPV vaccine increases, their attitude becomes progressively more Adequate.[5] This relationship is characterized by a Pearson's r value indicative of a moderate-to-strong positive link.

Table 4.6.1: Correlation Analysis of Knowledge and Attitude Scores

Variable Pair	**Mean Score**	**S.D.**	**Pearson r**	**P-value**	**Interpretation**
Knowledge (Post)	21.96	3.228	0.68	< 0.01	Significant Positive Correlation
Attitude (Post)	72% Adequate				

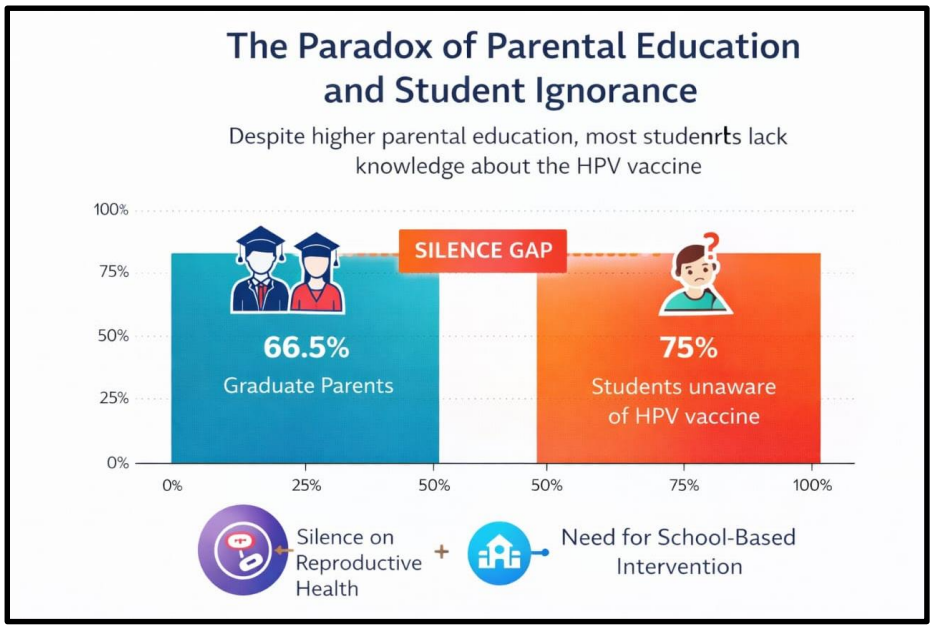
This correlation demonstrates that health education is not merely an academic exercise but a tool for behavioral change. By increasing knowledge about the risks of cervical cancer and the safety of the vaccine, the booklet successfully removed the cognitive barriers that were fueling "Inadequate" attitudes. The fact that this correlation holds true across different demographic strata (despite the baseline rural-urban divide) suggests that the educational mechanism of the self-instructional booklet is universally applicable once access is provided.

Sociological and Clinical Implications of Research Findings:-

The data from the 200 students in Bhopal provides several second-order insights that are critical for refining public health policy.

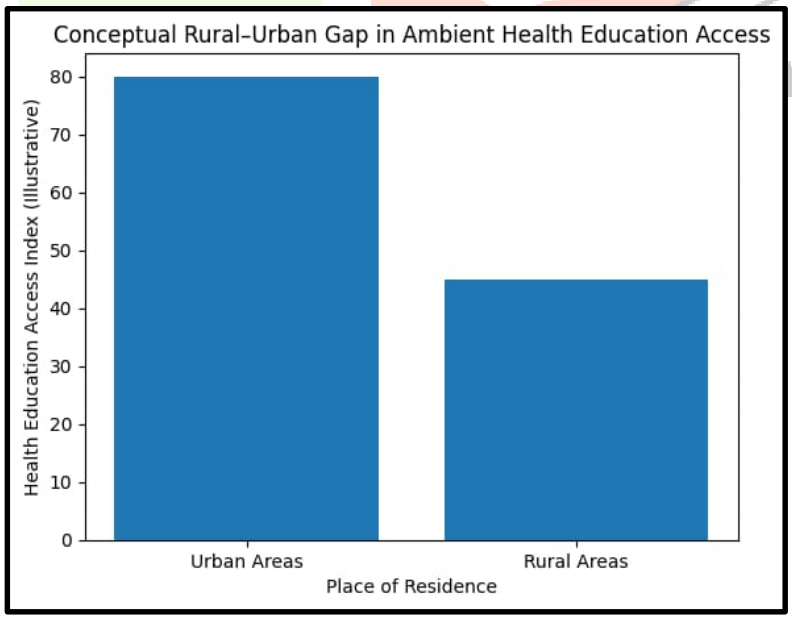
The Paradox of Parental Education and Student Ignorance

One of the most striking findings is that 66.5% of parents were graduates, yet 75% of their children had no prior knowledge of the HPV vaccine. This highlights a "silence gap" in Indian households regarding reproductive health. Graduation status in Bhopal does not automatically equate to proactive health communication within the family, especially for vaccines perceived as linked to sexual activity. This finding underscores the necessity of school-based programs, as the educational system must fill the void left by domestic silence.



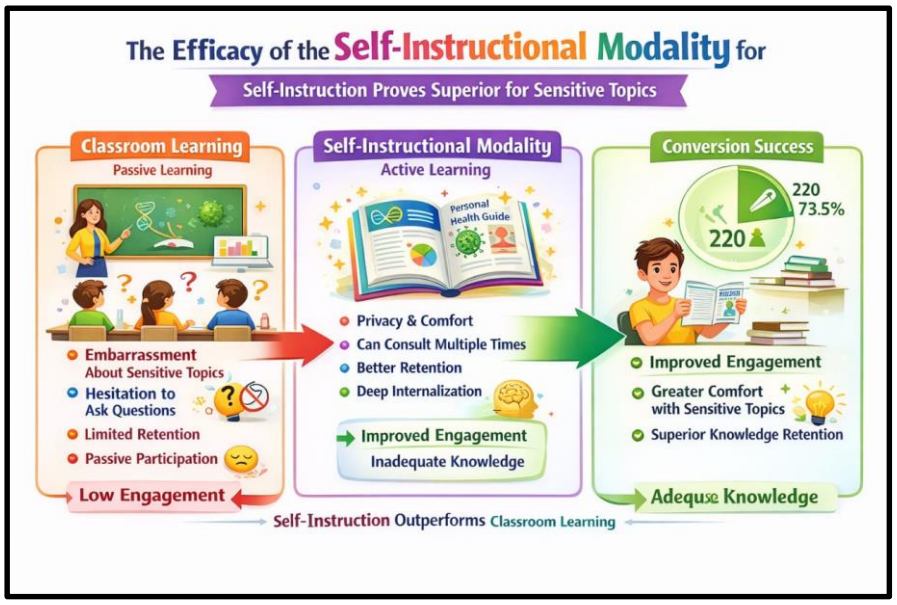
Geographic Location as a Primary Determinant of Health Literacy

The statistical significance of "Place of Residence" ($\chi^2 = 6.9$) points to a critical rural-urban divide in Madhya Pradesh. Urban environments provide "ambient health education" through clinics, billboards, and more active school health programs, whereas rural students are often isolated from these stimuli.[8] To achieve national goals in cervical cancer prevention, future interventions must prioritize the "de-marginalization" of rural school districts through mobile health education units and the wide-scale distribution of self-instructional materials.[11]



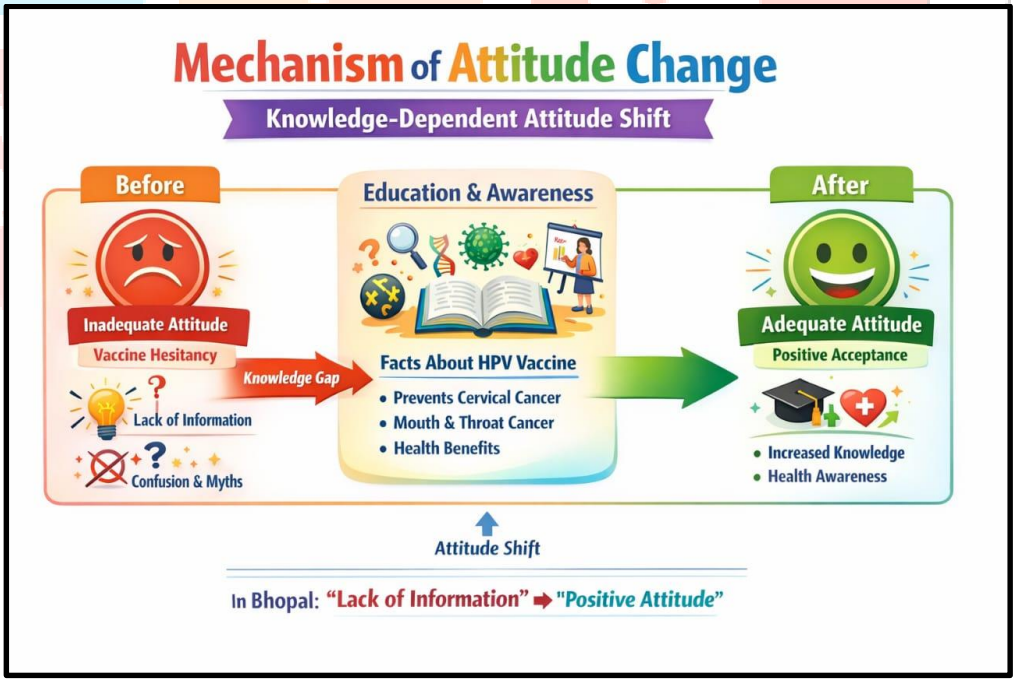
The Efficacy of the Self-Instructional Modality for Adolescents

The transition of 200 students into the "Adequate Knowledge" category (73.5%) proves that self-instruction is superior to traditional passive learning for sensitive topics.[6] Adolescents may feel embarrassed to ask questions in a classroom setting about a vaccine that prevents "genital warts" or "cervical cancer". A booklet provides a private, authoritative source that a student can consult multiple times, allowing for a deeper internalization of the information and a subsequent shift in attitude.[4]



Mechanism of Attitude Change

The elimination of "Inadequate" attitudes (0%) post-test suggests that adolescent resistance to the HPV vaccine is "knowledge-dependent" rather than "ideology-dependent".[3] Unlike some regions where vaccine hesitancy is rooted in religious or philosophical opposition, in Bhopal, it appears to be rooted in a simple lack of information. Once the factual void is filled—specifically regarding the vaccine's role in preventing mouth, throat, and cervical cancers—the students naturally shift toward an Adequate stance.



Acknowledgment

"Gratitude is not only the greatest of virtues, but the parent of all others."

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