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Dissertation Submission

Knowledge, attitude and practice (KAP) on cervical cancer screening and related challenges

A primary study using a semi-structured questionnaire (cross-sectional comparative KAP study)

Guided by-
Dr. (Col) Mahender Kumar
Professor

Presented by-
Arnab Basak (1687)
MBA (Hospital and Health Management)

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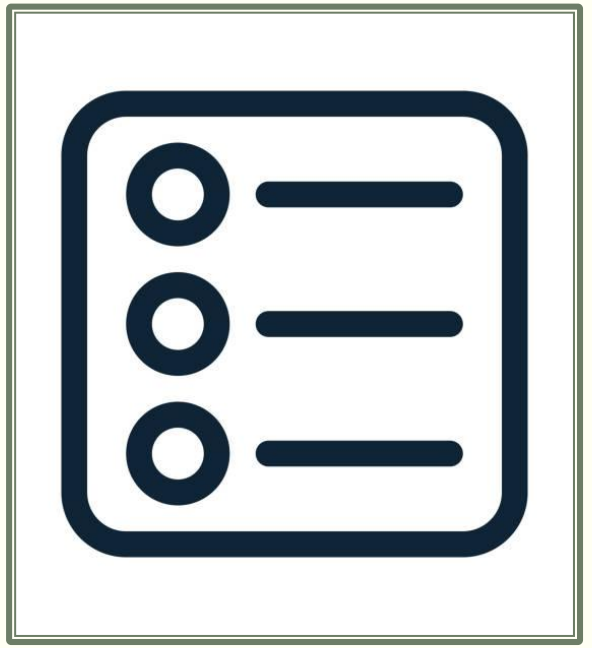
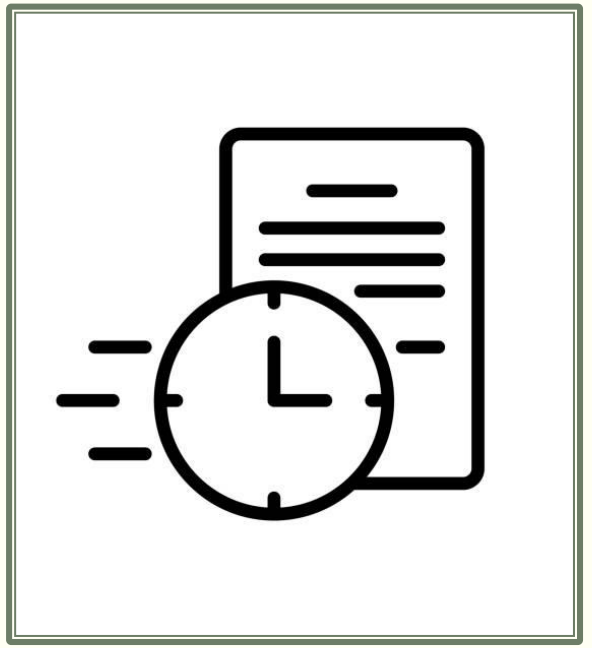


INTRODUCTION



Introduction

Global Burden of Cervical Cancer

- **Cervical cancer** is the **4th leading cause of cancer-related deaths** among women globally (Bray F et al., 2018).
- **85% of global deaths** due to cervical cancer occur in **developing countries** (Atun R et al., 2015).
- Incidence is **highest in sub-Saharan Africa (90%)** (Brisson M et al., 2020).
- **9 out of 10 deaths** occur in **low- and middle-income countries** (Arbyn M et al., 2019).
- High-income countries are seeing **declining incidence rates** due to preventive strategies (Simms KT et al., 2019).
- In India, cervical cancer is a **major health burden**, especially in **HIV-positive women**, where it's classified as an **AIDS-defining illness** (WHO, 2013).

Role of Screening and Prevention

- **Reduction in incidence** in developed nations is largely due to **screening programs** (Bray F et al., 2018).
- Discovery of **HPV as the main cause** of cervical cancer led to effective prevention and control measures (Zhang S et al., 2020).
- In **2020**, the **WHO launched a global strategy** to eliminate cervical cancer (WHO, 2020).
    - Key strategies include **HPV vaccination**, **screening**, and **treatment**.

KAP Studies in Public Health

- **KAP (Knowledge, Attitude, Practice) studies** are survey-based tools used in **public health research** (Andrade C et al., 2020).
- They help assess public understanding, mindset, and behaviors regarding a specific health issue.
- Commonly conducted using **structured or semi-structured questionnaires**.

Introduction

Situation in India: Current Statistics and Challenges

- **Asia reports 58.2%** of cervical cancer cases; **India contributes significantly** (Singh M et al., 2019).
- Each year, **96,000+ Indian women** are diagnosed; **60,000+ die** (Singh M et al., 2022).
- Regional disparities:
  - **Lowest mortality**: Jammu & Kashmir
  - **Highest mortality**: Tamil Nadu
  - **Largest decline** (1990–2019): Jharkhand & Gujarat

Socio-Cultural and Infrastructural Barriers

- **NFHS-5 (2019–21)**: Only **2.2% urban** and **1.7% rural** women (aged 30–49) underwent screening.
- **Awareness gaps** directly affect **attitudes and practice**.
- Barriers include:
  - **Patriarchal norms** and **stigma**
  - **Discrimination** and **gender roles**
  - **Poor infrastructure** and **limited healthcare access**
- Despite efforts, **KAP on cervical cancer remains low** (Taneja N et al., 2021).

Screening Techniques and Risk Factors

- **Screening methods** suitable for **resource-limited settings**:
  Visual Inspection with **Acetic Acid (VIA)**
  Visual Inspection with **Lugol's Iodine (VILI)**
  Magnavisualizer
- Other common methods:
  Pap smear, **HPV-DNA test**, **cytology**
  (Srivastava, Anand Narain et al., 2018)
- **Risk Factors** include:
  HPV infection, **early sexual debut**, **multiple partners**, **high parity**
  Smoking, **low socio-economic status**
  (Ghebre RG et al., 2017)
- **Symptoms**:
  Post-coital bleeding
  Bleeding between periods
  Postmenopausal bleeding
  Foul-smelling vaginal discharge, **pelvic pain** (National Cancer Institute, 2022)

Introduction

Rationale for the study: There is limited literature on the KAP of Indian women regarding cervical cancer screening. This study addresses this gap by analyzing KAP through a **validated semi-structured tool** and performing **advanced statistical analysis** to **identify challenges of screening uptake**.

Objectives of the study:

Primary Objective:

- To assess and analyze the KAP (Knowledge, Attitude, and Practice) levels of the participants related to cervical cancer screening.

Secondary Objectives:

- To check the association between socio-demographic variables and the KAP variables.
- To evaluate the internal consistency of attitude variables.
- To check the correlation between the knowledge and attitude of the participants.
- To examine whether the knowledge and attitude of participants predict screening behavior.
- To provide recommendations to improve awareness, attitude, and screening uptake based on the findings.

Significance of the study:

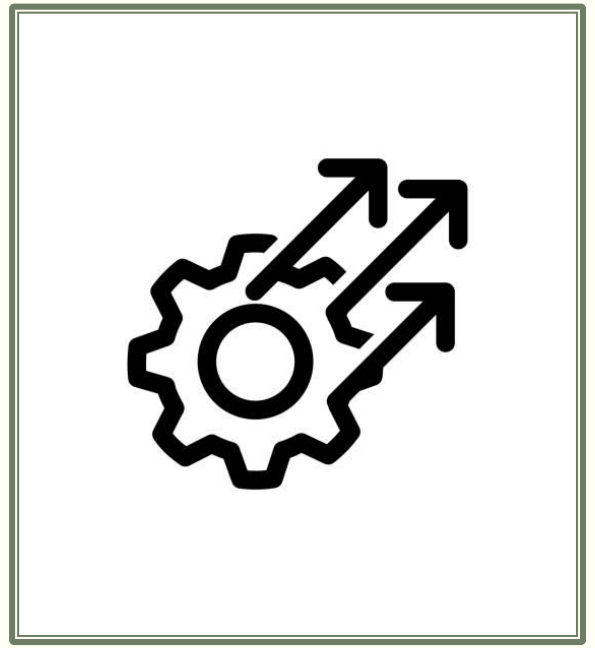
The findings of this study can inform **targeted educational and awareness campaigns** and **improve cervical cancer screening outreach**, especially in under-screened populations. **Public health planners and policymakers** will likely benefit from this study.

REVIEW OF LITERATURE

Review of Literature

"Knowledge, attitude, and practice about cervical cancer and its screening among community healthcare workers of Varanasi district, Uttar Pradesh, India" (Khanna D et al., 2019)	· High Awareness, Poor Practice · Urban–Rural Disparity in Knowledge · Knowledge Predicts Screening Uptake · Key Barriers to Screening
"Cervical cancer: a hospital based KAP study among women aged 18 years and above in Northern India" (Gupta RK et al., 2019)	· High Awareness but Poor Practice · Positive Attitude Not Translating to Action · Low HPV Vaccination Rate · Misconceptions and Social Stigma
"Knowledge, attitude and practices towards cervical cancer and its screening among Women from tribal population of Anuppur district" (Bharti Gupta et al., 2023)	· Poor Awareness and Knowledge · Negative Attitudes and Misconceptions · Low Screening Uptake and High Barriers · Healthcare Providers' Deficient Knowledge
"Cervical Cancer Prevention Among Rural Women in Gujarat, India: A Mixed Methods Study on Risk Factors and KAP (Knowledge, Attitude and Practice)" (Gandhi R et al., 2024)	· Extremely Low Awareness and Screening Practice · Socio-demographic Predictors of Poor Knowledge and Practice · Attitude-Behavior Gap · Deeply Rooted Cultural and Gender Norms as Barriers
"Cervical cancer awareness, knowledge, behavioural patterns, and practice of screening and vaccination in females of hilly regions of North India – A hospital-based observational study" (Yadav P et al., 2024)	· Extremely Poor Knowledge Despite Awareness, · High Attitude Scores, Poor Practice · Strong Correlation Between Education and KAP · Barriers Due to Geography and Access

METHODOLOGY



Methodology

Study Setting:
The data was collected through Google Forms distributed via various online platforms such as WhatsApp, email, and social media.

Study Population:
Inclusion Criteria
- Female participants aged 18 years and above.
- Those who provided informed consent to participate.

Exclusion Criteria
- Individuals previously diagnosed with cervical cancer.

Study Duration:
The data collection and analysis were conducted over a period of one month, while the entire dissertation took 3 months.

Study Design: Primary cross-sectional study using semi-structured questionnaire.

Research Questions:
1. What is the level of knowledge, attitude, and practice (KAP) regarding cervical cancer and its screening among women in the study population?
2. How are socio-demographic characteristics associated with women's knowledge, attitude, and practice regarding cervical cancer screening?
3. Are the Likert-scale items used to assess attitude toward cervical cancer screening internally consistent?
4. Is there a relationship between women's knowledge and their attitude towards cervical cancer screening?
5. Do knowledge and attitude scores predict whether a woman has ever been screened for cervical cancer?
6. What actionable insights can be derived from KAP patterns to guide awareness programs and improve cervical cancer screening uptake?

Methodology (Continuation)

Sample Size:
Calculated 600 (Considering non-response rate)
Collected actual data from **163 respondents (samples).**

Sampling Technique:
Convenience Snowball technique

Ethical Considerations:

- Informed Consent
- Voluntary Participation
- Anonymity and Confidentiality
- Data Use

Statistical Analysis (IBM SPSS):

- Descriptive Statistics
- Reliability Analysis
- Chi-square Tests
- Binary Logistic Regression
- Correlation Analysis

Data Collection Procedures and Study Instrument (semi-structured questionnaire)

- Socio-demographic information
- Knowledge about cervical cancer
- Attitude towards screening (using Likert-scale items)
- Practice-related questions (e.g., whether screened or not)

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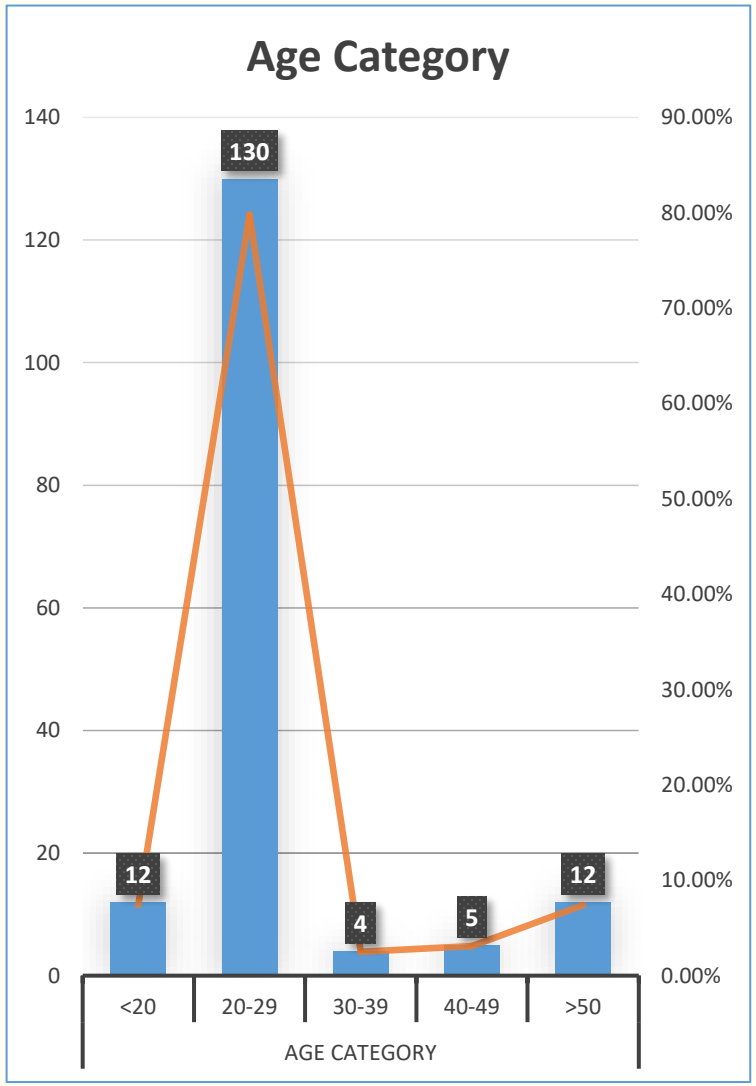
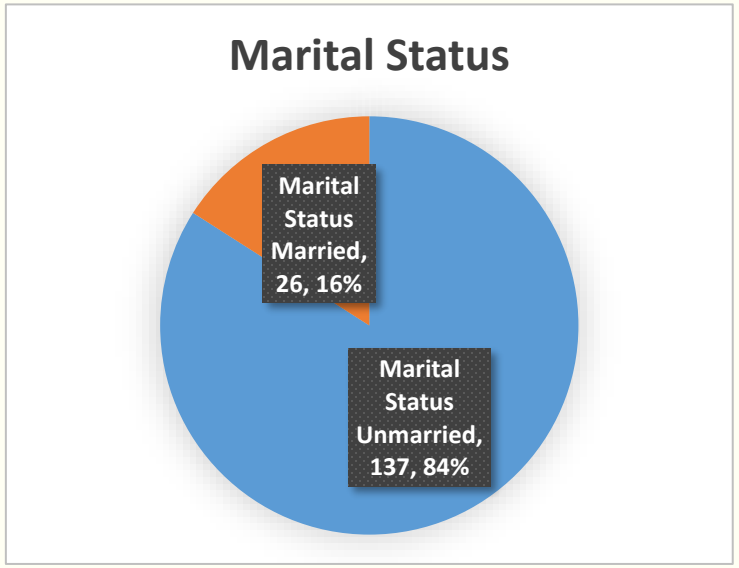
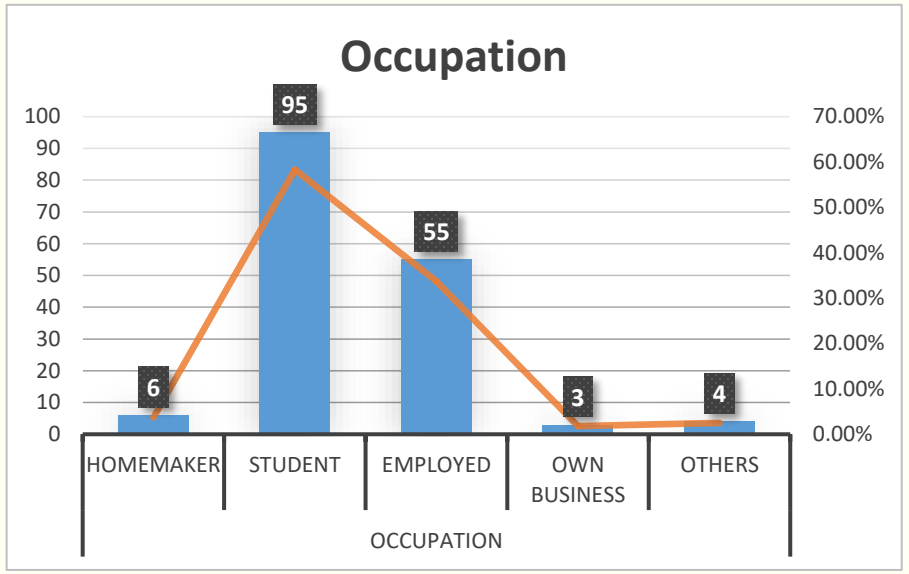
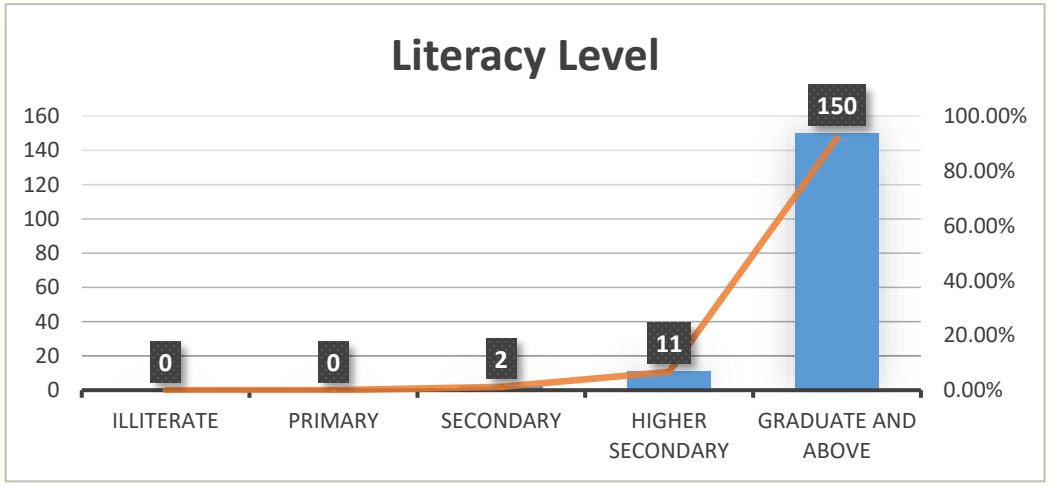
RESULTS

Participant Profile Overview (Socio-demographics)









Residence:
Urban – 95%, Rural – 5%

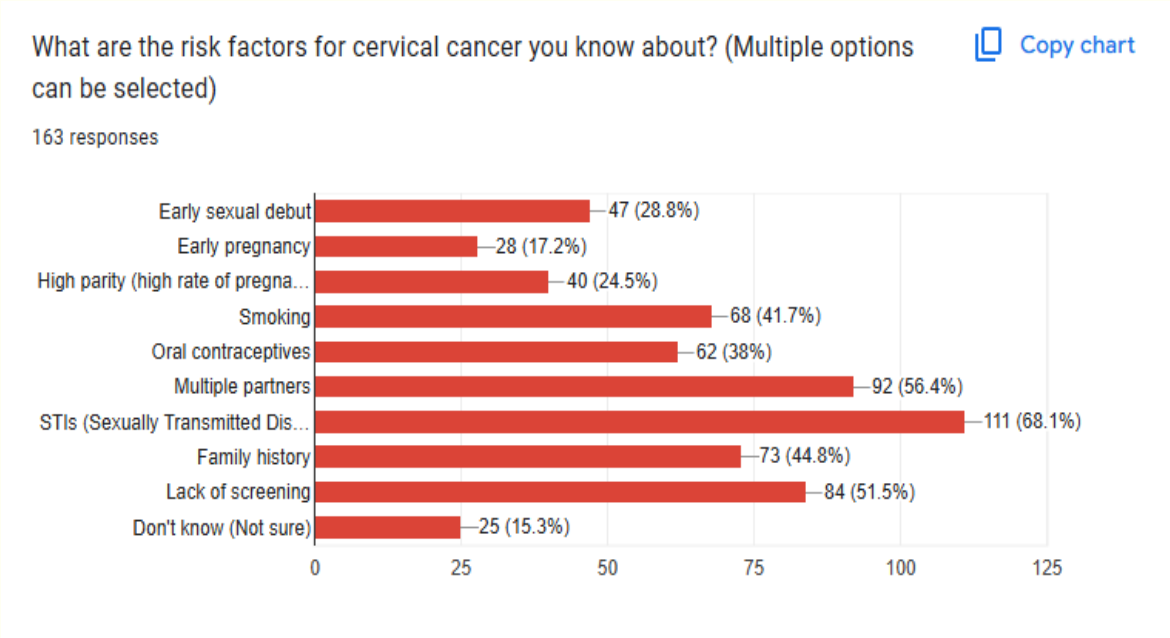
Family Type:
Joint family – 26%,
Nuclear family – 74%

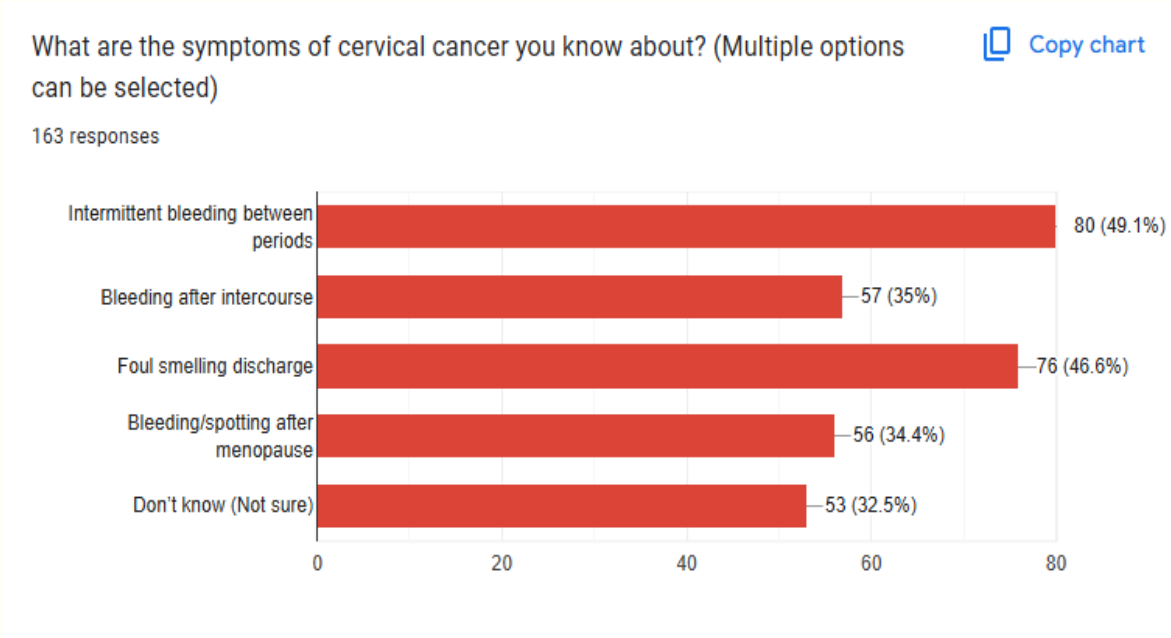
Knowledge Summary of Participants

Knowledge Highlights:

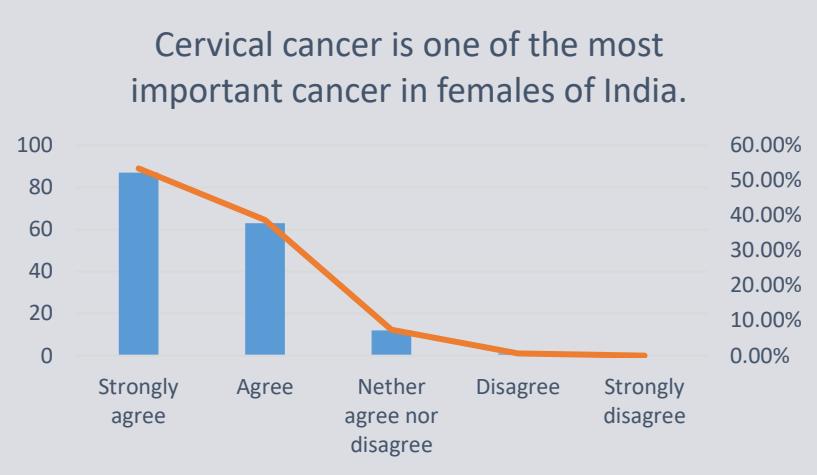
- Heard of cervical cancer: **93%**
- Prevention possible: **77%**
- Screening eligibility awareness: **66% correct**
- Curable if detected early: **79%**

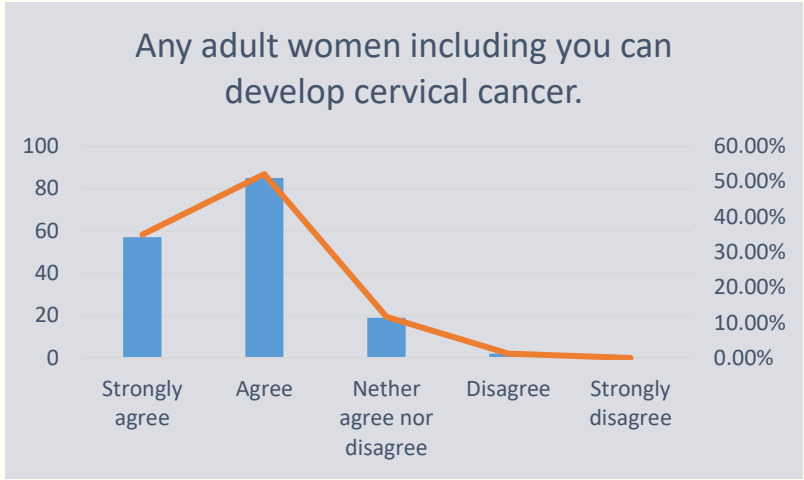
Source of information (if you have heard of cervical cancer)	Health workers	66	43.70%
	Family and relatives	0	0.00%
	TV and media	62	41.10%
	Others	23	15.20%

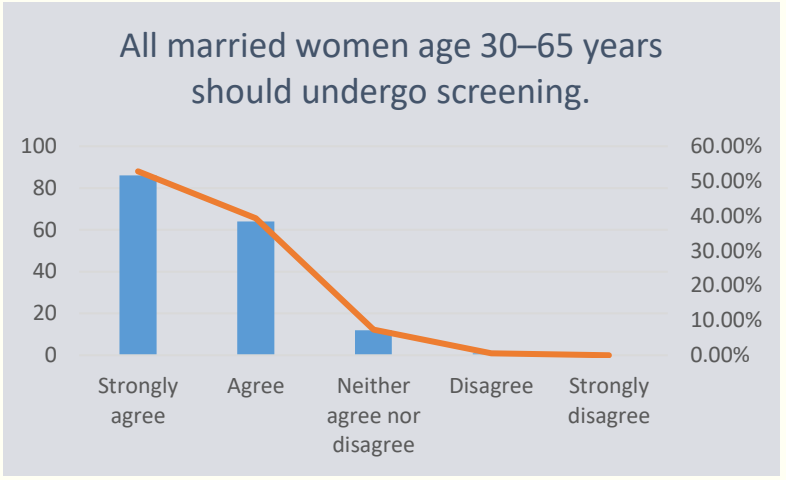


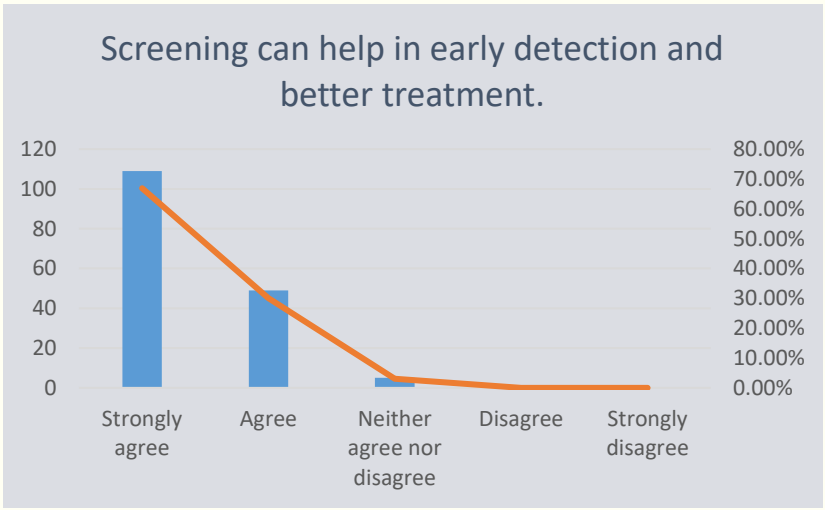


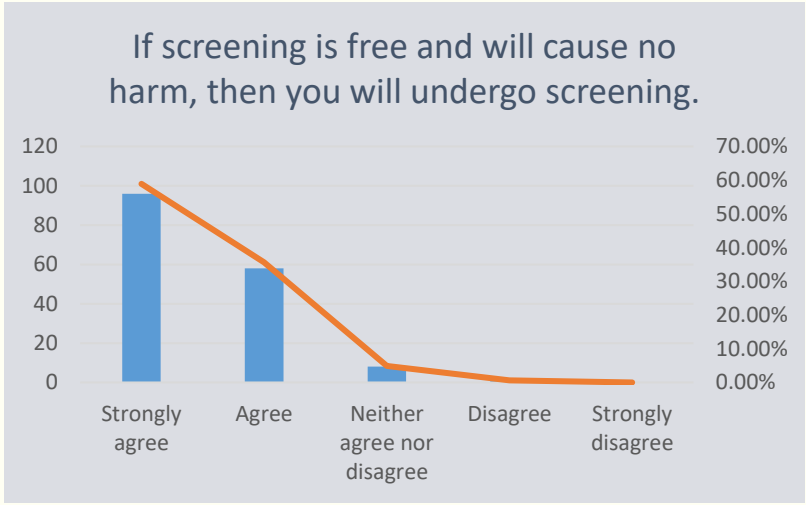
Attitude and Practice Summary of Participants

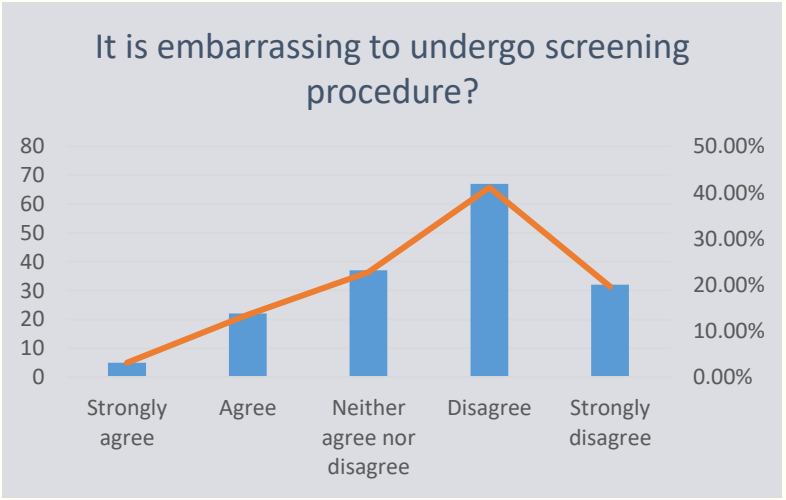












Practice: The analysis showed that less than 10% of the participants had undergone screening for cervical cancer.

Internal consistency of Attitude variables (Reliability analysis)

Summary of Reliability analysis of Attitude variables (5 items):

Measure	Value
Number of Items	5
Cronbach's Alpha	0.794
Standardized Alpha	0.800
Inter-Item Correlation Range	0.31 – 0.63
Corrected Item-Total Correlation Range	0.495 – 0.675

The scale demonstrated **good internal consistency**, with a **Cronbach's alpha of 0.794**. Inter-item correlations ranged from **0.31 to 0.63**, indicating a moderate and consistent relationship among the items. Corrected item-total correlations ranged from 0.50 to 0.68, and removal of any item would result in a lower alpha, suggesting that all five items contribute meaningfully to the scale.

Chi-square tests for association

Note: Used **FET (Fisher's Exact Test)** to **ensure statistical validity** when expected frequencies were low, especially in 2x2 or smaller subgroup analyses. Also, used the **Monte Carlo method** when the table was too large for Fisher's exact and the chi-square assumptions weren't met. Additionally, **Cramér's V** helped you interpret the **magnitude** of the relationships found in chi-square tests (0 for no association and 1 for strong association).

Chi-square summary table between Socio-demographic variables and Knowledge variables:

Knowledge Variable	Socio-demographic Variable	χ^2 (df)	p-value	Statistical Significance	Test Used	Phi / Cramer's V
Have you ever heard of cervical cancer?	Age	33.37 (4)	0.000	**Significant**	MC	0.452
	Occupation	19.44 (4)	0.012	**Significant**	MC	0.345
	Literacy Level	26.15 (2)	0.006	**Significant**	MC	0.401
	Marital Status	6.39 (1)	0.025	**Significant**	FET	0.198
Can cervical cancer be prevented?	A6. Family Type	6.09 (2)	0.025	**Significant**	MC	0.193
Is cervical cancer curable if detected early?	A3. Occupation	18.86 (8)	0.049	**Significant**	MC	0.240

Chi-square tests for association

Chi-square summary table between Socio-demographic variables and Attitude variables:

Attitude Variable	Socio-demographic Variable	χ^2 (df)	p-value	Statistical Significance	Test Used	Phi / Cramer's V
Cervical cancer is one of the most important cancers	A4. Literacy Level	16.35 (6)	0.037	**Significant**	MC	0.224
Will undergo screening if free and causes no harm	A2. Residence Type	9.10 (3)	0.049	**Significant**	MC	0.236

Chi-square summary table between Socio-demographic variables and Practice variables:

Practice Variable	Socio-demographic Variable	χ^2 (df)	p-value	Statistical Significance	Test Used	Phi / Cramer's V
Ever been screened for cervical cancer	A1. Age	41.05 (4)	0.000	**Significant**	MC	0.502
	A5. Marital Status	23.91 (1)	0.000	**Significant**	FET	0.383

Binary Logistic regression (knowledge and attitude score predicting screening behavior)

(**Total Knowledge score** was computed by assigning 1 point for each correct answer, 0 for incorrect or don't know responses. Entire knowledge section variables were considered except optional question).
(**Total Attitude score** was computed by assigning 1 point (least) to "strongly disagree" responses, all the way similarly to assigning 5 point (maximum) to "strongly agree" responses. All the other responses were given 2, 3 and 4 points in the order).

Summary of Binary Logistic Regression using the Knowledge score to predict screening behavior:

Output Area	Result	Statistical Significance
Omnibus Test	$\chi^2(1) = 0.218$, p = 0.641	**Not statistically significant**
Knowledge Score Coefficient	B = –0.038, p = 0.642	**Not a significant predictor**

Binary logistic regression showed that total knowledge score was **not a significant predictor** of whether women had ever been screened for cervical cancer, $\chi^2(1, N = 163) = 0.22$, $p = 0.641$ and knowledge score was not statistically significant ($p = 0.642$).

Summary of Binary Logistic Regression using the Attitude score to predict screening behavior:

Output Area	Result	Statistical Significance
Omnibus Test	$\chi^2(1) = 0.009$, p = 0.924	**Not statistically significant**
Attitude Score Coefficient	B = –0.011, p = 0.924	**Not a significant predictor**

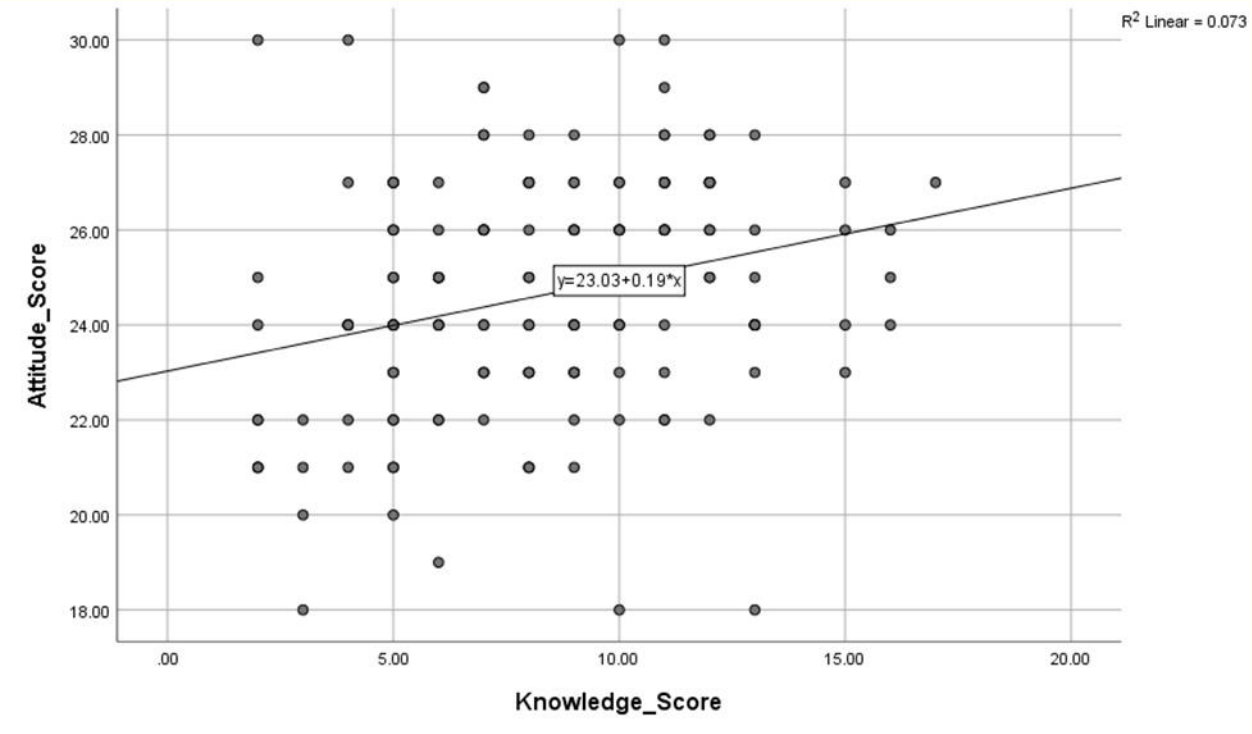
Binary logistic regression showed that total attitude score was **not a significant predictor** of whether women had ever been screened for cervical cancer, $\chi^2(1, N = 163) = 0.01$, $p = 0.924$ and knowledge score was not statistically significant ($p = 0.642$).

Relationship between knowledge & attitude scores (Correlation Analysis)

Spearman's Correlation Output (Knowledge and Attitude scores):

Variables	Correlation Coefficient (ρ)	Sig. (2-tailed)	N
Knowledge & Attitude Scores	0.295	0.000	163

There is a **moderate**, **positive**, and **statistically significant** monotonic relationship between **Knowledge Score** and **Attitude Score**.



Scatterplot showing the relationship between knowledge and attitude scores:

A weak but statistically significant positive linear relationship was observed with the regression line equation: $y = 23.03 + 0.19x$.

The linear trend line ($y = 23.03 + 0.19x$) suggests that for every 1-point increase in knowledge, the attitude score increases by about 0.19 units. The $R^2 = 0.073$ indicates that about 7.3% of the variation in attitude is explained by knowledge — which is low, but meaningful.

DISCUSSION

Key Findings and Comparison with Literature

Knowledge and Literacy

The study found a high awareness rate—92.6% had heard of cervical cancer—but detailed knowledge on screening eligibility and prevention was limited. Literacy level showed a statistically significant association with key knowledge variables such as "ever heard of cervical cancer" ($p = 0.006$, Cramer's $V = 0.401$) and occupation also influenced knowledge of prevention and curability. These results reinforce findings by **Taneja et al. (2021)** and **Ghosh et al. (2021)**, who identified education and occupation as major predictors of awareness and health-seeking behavior.

Attitude and Age or Literacy

Attitudes towards screening were generally favorable, with over 95% expressing willingness to undergo screening if it were free and harmless. However, a statistically significant association was observed only between **residence type** and this willingness ($p = 0.049$, Cramer's $V = 0.236$), and between **literacy level** and the belief that cervical cancer is a major health issue ($p = 0.037$). These findings echo the results of **Puranik et al. (2020)** and **Mehrotra et al. (2022)**, which showed urban and more literate populations are more receptive to preventive messaging and less influenced by stigma.

Key Findings and Comparison with Literature

Knowledge–Attitude Correlation

A moderate and statistically significant positive correlation was found between knowledge and attitude scores ($\rho = 0.295$, $p < 0.001$). This supports the KAP framework where increased knowledge tends to foster more positive attitudes, as highlighted in the review by **Taneja et al. (2021)** and observed in **Yadav et al. (2024)**. However, the strength of the correlation suggests that additional factors also influence attitudes and behavior, such as cultural and psychological barriers.

Socio-Demographic Influence on Practice

Only 9.2% of respondents had ever been screened. Chi-square analysis revealed that **age** ($p < 0.001$, Cramer's $V = 0.502$) and **marital status** ($p < 0.001$, Cramer's $V = 0.383$) had statistically significant associations with screening practice, while other variables like education and occupation did not. This supports **NFHS-5 (2019-21)** findings and is consistent with **Mehrotra et al. (2022)** and **Gandhi et al. (2024)**, who showed that screening behavior was more common in older, married women due to increased perceived risk or healthcare exposure.

Strength and Limitations of the study

Strengths of the Study:

- ❑ The use of a **semi-structured KAP questionnaire** allowed in-depth capture of perceptions and behaviors.
- ❑ Inclusion of a **broad age range** and women from different occupational and educational backgrounds added diversity.
- ❑ Reliability analysis (Cronbach's $\alpha = 0.794$) confirmed good internal consistency of attitude items.
- ❑ Usage of various analytical tests on the acquired data.

Limitations:

- ❑ The sample was collected using **convenience snowball sampling**, limiting generalizability.
- ❑ The **online survey format** may have excluded digitally illiterate or low-income groups, underrepresenting rural or marginalized populations.
- ❑ **Self-reporting bias** could have influenced responses, especially regarding sensitive topics like reproductive health.
- ❑ **Very low practice prevalence** reduced the statistical power of some analyses (e.g., logistic regression).

Interpretation of Non-significant Findings:

Despite many participants having good knowledge and positive attitudes, the **actual practice (screening uptake) remained very low (9.2%)**. Binary logistic regression found that neither **knowledge** ($p = 0.642$) nor **attitude** ($p = 0.924$) significantly predicted screening behavior.

This suggests **disconnect between awareness and action**, possibly influenced by:

- Cultural stigma and embarrassment (as shown in attitude item analysis).
- Fear and misconceptions.
- Lack of proactive healthcare engagement unless symptoms arise.

CONCLUSION

Conclusion

- Paradox—**high awareness and positive attitude coexist with poor screening behavior**.
- For effective cervical cancer prevention, a **multi-pronged strategy** addressing knowledge, accessibility, stigma, and trust in healthcare systems is crucial.

Implications for Public Health Practice

- Increasing knowledge is **not sufficient**. Interventions should address **emotional and cultural barriers** too.
- Efforts should be tailored for **older and married women**, while also focusing on **school and college-based awareness** for younger groups.
- **Incorporating counseling** in primary settings could improve translation of positive attitude into action.

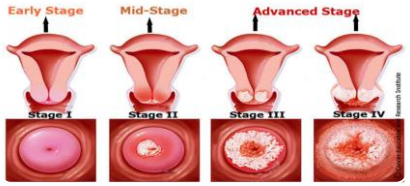
Suggestions for Future Research

- L**arger sample with stratified random sampling** for more generalizable findings.
- Include **qualitative components** to explore deeper socio-cultural dimensions.
- Evaluating the **effectiveness of targeted educational interventions** on changing screening behavior would be valuable.

Conclusion (Recommendations)

Strengthen Targeted Health Education Programs

Age-appropriate screening eligibility; Preventability and curability of cervical cancer; and Regular dissemination through schools, colleges, workplaces, and community groups.



Integrate Cervical Cancer Education into School/College Curricula

Incorporate structured cervical cancer education and reproductive health modules in higher secondary and college education to institutionalize awareness from a young age.

Leverage Health Workers and Mass Media for Information Dissemination

Community health workers (e.g., ASHAs, ANMs); Radio, TV, YouTube shorts, etc.; and Tailored content in local languages.

Address Social and Psychological Barriers to Screening

Run myth-busting sessions to normalize screening; Promote testimonials from women who've been screened; and Ensure gender-sensitive service delivery, e.g., female staff for screening.

Conclusion (Recommendations)

Increase Accessibility and Reduce Cost Barriers

Offer free or subsidized cervical cancer screening at primary health centers; and Organize regular screening camps with mobile clinics in rural and semi-urban areas.

Focus on Underserved/Disadvantageous Demographics

Rural women and homemakers through self-help groups; and Adult women with low education via Anganwadi centers and NGOs.

Integrate Cervical Screening into Existing Health Services

Maternal and child health programs; and Family planning and immunization visits.

Policy-Level Interventions

Mandatory inclusion of cervical cancer screening in national health checkup packages; Periodic monitoring and evaluation of KAP levels in districts or states; and Multi-pronged approach combining education, accessibility, de-stigmatization, and policy action.

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THANK YOU