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Knowledge, attitudes and practice toward cervical cancer screening and HPV vaccination among women in Bihar

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Abstract
Introduction: Cervical cancer is a major public health care burden. It can be prevented with proper screening if diagnosed early.
Objective: This study aims to assess women's knowledge on cancer cervix and its screening. To recognise the barriers preventing women to access the cervical cancer screening. To assess women s awareness on HPV vaccine.
Method: Cross sectional study conducted in Kurji Holy Family hospital where 200 patients were chosen randomly
and questionnaire filled by them to asses their knowledge on cerival cancer and its screening along with knowledge on HPV vaccination.
Results: Majority of patients belonged to 45-60 years. Only 61 participants had heard of cervical cancer and only 9 of them were aware of HPV as a cause of cancer. 22% knew about pap smear with 1 % gaining knowledge from media. Only 37 participants knew about HPV vaccination. Post counselling 79% agreed for undergoing pap test and 41 agreed for get their vaccinated.
Conclusion: In this study the knowledge of cervical cancer and pap smear is very poor but majority of participants showed positive attitude post counselling. Social media and the government needs to play active role in spreading awareness and improving accessibility among the women.

Keywords: Cervical cancer screening, pap smear, HPV vaccination

Introduction
Worldwide, cervical cancer is the second most common (12%) cancer in women, With 528,000 new cases detected every year, cervical cancer is most notable among lower resource countries of sub-Saharan Africa [1]. One woman dies of cervical cancer every 8 minutes in India [2]. Cervical cancer is the second most common cancer among Indian women (As per Globocan 2018) [3].

Cervical cancer is a preventable disease as it has a well defined, long pre-malignant phase which can be detected by regular screening tests and follow up. Unfortunately, most women in India are not aware about the screening. More women in India die from cervical cancer than in any other country. New cases of cervical cancer detected in India: 96,922 every year [4]. Deaths due to cervical cancer in India: 60,078/year [5].

An organized screening program can reduce incidence and mortality by 80% as shown in developed countries [6].

In developing countries like India, the first barrier to cytology-based screening programmes is to develop the necessary infrastructure to obtain and transport the Pap smears to laboratories for processing and interpretation. Thereafter, the results need to be communicated to the referring clinic and to the women who have been screened. This delay leads to women not coming back for the results Secondly, interpretation of the results requires training and maintenance of the same requires close supervision. Once a woman with an abnormal smear has been identified, she requires a referral for colposcopic assessment. Colposcopy, where available, tends to be located in tertiary, urban-based institutions and provided by specialists. This requirement creates problems of access for poor women, both urban and rural.

The modern management of pre invasive lesions is by Leep and LLTEZ and the its available only in tertiary care centres and done by experts. Hence, with limited screening, most women with abnormal smears are subjected to cone biopsy or hysterectomy, both of which are radical and expensive treatments thereby increasing the morbidity of the women [7].
Thus, early detection and regular screening is of paramount importance. The aim of this study was to assess knowledge of cancer cervix, screening methods, attitude toward and practice of Pap smear screening among the various women attending the opd in Patna from both rural and urban sectors

Aims and Objectives
To assess women's knowledge on cancer cervix and its screening
To recognise the barriers preventing women to access the cervical cancer screening.
To acknowledge various methods that can help women to access screening of cervical cancer
To assess women s awareness on HPV vaccine
To screen the eligible women and evaluate their results and counsel them to vaccinate their daughter s to prevent cervical cancer

Materials and Methods
Kurji Holy Family hospital is a tertiary referral centre in Patna with cervical cancer screening facilities. The women selected for this study were attending the opd for various complaints and non pregnant. Its a crossectional study conducted from 2018 to 2019. The study was approved by the ethical committee. Initially all patients attending the opd have been explained the nature of study. The patients who agreed to participate were given a consent form along with a predesigned, pretested, self-administered multiple response questionnaires with both closed and open ended questions.
The questionnaire items consisted of various basic facts about cervical cancer and screening, attitude of patients toward screening and their knowledge on HPV vaccine. Finally, women are explained and offered Pap smear for themselves and HPV vaccination of their daughters (if in eligible age group i.e. 9-14 years) for early detection of pre-invasive lesions and prevention of cervical cancers respectively.

The data collected were thoroughly screened and entered into MS Excel spread sheets for analysis. The procedures involved were transcription, preliminary data inspection, and interpretation. Descriptive statistics Chi- square tests were done, and the significance of tests was decided at P = 0.05. Data was analysed using both univariate and multivariate analysis/binary logistic regression.

Description of Questionnaire
A total of 200 participants were given the questionnaire and asked to fill. The questionnaire consisted of 5 parts with each part having many sub questions. A total of questions were asked and grouped into the following tables and parts.

A (Table A): Consisting of the demographic data

B (Table B): To assess the knowledge of cancer cervix among the participants. Those who knew about cervical cancer were eligible for next sub questions [questions 1 to 6]. The participants with no knowledge about the cervical cancer were directed to part C (table 3).

C (Table C): The attitude and awareness among the participants regarding Pap smear testing (question 7 to 12) and HPV vaccine (question 13 to 16) was assessed. Participants with no awareness of pap smear were directly asked to proceed with question 12 and those with no knowledge of both pap smear and HPV vaccine were asked to proceed with D (table 4)

D (Table D): participants were asked the various barriers preventing them from attending screening and also the suggestions they would like to give to make screening more accessible to them. (Question 17 and 18)

E (Table E): After counselling the number of women who accepted screening were analysed and their results were evaluated. Apart from this if the participants had daughter s under the age 9- 14 years were counselled for vaccination and the number of women who vaccinated their daughters were analysed (question 19 to 21).

Results and observation

Table 1A: Various demographic data of participants

	Frequency	Percent	Valid Percent	Cumulative Percent
Age (years)				
<30	53	26.5	26.5	26.5
31-45	97	48.5	48.5	75.0
45-60	45	22.5	22.5	97.5
>60	5	2.5	2.5	100.0
Total	200	100.0	100.0	
Marital Status				
Single	24	12.0	12.0	12.0
Married/live in	171	85.5	85.5	97.5
Separated/Divorced	5	2.5	2.5	100.0
Total	200	100.0	100.0	
Family				
Nuclear	94	47.0	47.0	47.0
Joint	106	53.0	53.0	100.0
Total	200	100.0	100.0	
Religion				
Hindu	143	71.5	71.5	71.5
Muslim	26	13.0	13.0	84.5
Christain	31	15.5	15.5	100.0

Total	200	100.0	100.0	
Residence				
Urban	119	59.5	59.5	59.5
Rural	81	40.5	40.5	100.0
Total	200	100.0	100.0	
Education				
Illiterate	36	18.0	18.0	18.0
<5th std	57	28.5	28.5	46.5
<12th std	31	15.5	15.5	62.0
>12th std Total	76	38.0	38.0	100.0
Total	200	100.0	100.0	
Occupation				
Housewife	100	50.0	50.0	50.0
Working	67	33.5	33.5	83.5
Not Working	11	5.5	5.5	89.0
Student	22	11.0	11.0	100.0
Total	200	100.0	100.0	
Socio Economic Status				
Low	33	16.5	16.5	16.5
Lower middle	114	57.0	57.0	73.5
Upper middle	51	25.5	25.5	99.0
High	2	1.0	1.0	100.0
Total	200	100.0	100.0	

Table 2B: Knowledge of cervical cancer

	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
1. Have you heard of carcinoma cervix				
Yes	61	30.5	30.5	30.5
No	139	69.5	69.5	100
Total	200	100	100	
2. Does it take many years to develop cervical cancer				
Don't know	7	3.5	11.5	11.5
True False	35	17.5	57.4	68.9
Unsure	3	1.5	4.9	73.8
Total	16	8	26.2	100
Not eligible for question	61	30.5	100	
Total	139	69.5		
	200	100		
3. Can cancer cervix be prevented				
Don' Know	5	2.5	8.2	8.2
TRUE	40	20	65.6	73.8
Unsure	16	8	26.2	100
Total	61	30.5	100	
Not eligible for question	139	69.5	69.5	
Total	200	100	100	
4. Is postmenopausal bleeding a symptom of cervical cancer				
Don't know	6	3	10.3	10.3
TRUE	44	22	75.9	86.2
FALSE	1	0.5	1.7	87.9
Unsure	10	5	12.1	100
Total	61	80.5	100	
Not eligible for question	139	71		71
Total	200	100		100
5. Does a virus by name HPV cause cervical cancer				
TRUE	9	4.5	14.8	14.8
FALSE	43	21.5	70.5	85.2
Unsure	9	4.5	14.8	100
Total	61	30.5	100	
Not eligible	139	69.5	69.5	
Total	200	100	100	
6. If detected early can cancer cervix be treated or cured				
TRUE	7	3.5	11.5	11.5
FALSE	48	24	78.7	90.2
Unsure	6	3	9.8	100
Total	61	30.5	100	
Not eligible	139	69.5	69.5	
Total	200	100	100	

Table 3C: Knowledge on Pap smear And HPV Vaccine

	Frequency	Percent	Valid Percent	Cumulative Percent
7. Have you heard of pap smear test				
Yes	45	22.5	22.5	22.5
No	155	77.5	77.5	100
Total	200	100	100	
8. From where did you hear about the pap test				
Not eligible for question	155	77.5	77.5	77.5
1,2,5	1	0.5	0.5	78
1234	3	1.5	1.5	79.5
12345	3	1.5	1.5	81
2	26	13	13	94
234	2	1	1	95
3	3	1.5	1.5	96.5
4	3	1.5	1.5	98
5	4	2	2	100
Total	200	100	100	
9. Have you undergone pap test				
Yes	9	4.5	20	20
No	36	18	80	100
Total	45	22.5	100	
Not eligible for question	155	77.5		
Total	200	100		
10. if you have done pap test then how many times				
Once	39	19.5	86.7	86.7
Twice	6	4.5	13.3	100
Total	45	22.5	100	
Not eligible for question	155	77.5		
Total	200	100		
11. whom do you prefer to take the pap test				
Gynecologist	42	21	93.3	93.3
Family doctor	2	1	4.4	97.8
Nurse	1	0.5	2.2	100
Total	45	22.5	100	
Not valid for the question	155	77.5		
Total	200	100		
12. if you have never done the pap test would you do it in future				
Yes	165	82.5	84.2	84.2
No	10	5	5.1	89.3
Unsure	25	12.5	10.7	100
Total	200	100	100	
13. are you aware of HPV vaccine				
Yes	37	18.5	18.5	18.5
No	163	81.5	81.5	
Total	200	100	100	100
14. from where did you get the knowledge about the vaccine				
	163	81.5	81.5	81.5
1	3	1.5	1.5	83
	3	1.5	1.5	83
1,3,5	1	0.5	0.5	83.5
1234	3	1.5	1.5	85
2	20	10	10	95
234	3	1.5	1.5	96.5
3	4	2	2	98.5
5	3	1.5	1.5	100
Total	200	100	100	
15. Do you know the number of doses of HPV vaccine				
One	20	10	54.1	54.1
Two	14	7	37.8	91.9
Three	3	1.5	8.1	100
Total	37	18.5	100	
Not eligible for question	163	81.5		
Total	200	100		
16. girls/ women should continue to do pap test even after HPV vaccination				
Don't know	4	2	11.1	11.1
TRUE	28	14	77.8	88.9
FALSE	1	0.5	2.8	91.7

Unsure	3	1.5	8.3	100
Total	36	18	100	
Not eligible for question	164	82		
Total	200	100		

Key for Question 8
1. TV/radio
2. Doctor/nurse
3. newspapers/magazine
4. Friends/spouse
5. Others

Key For Question 14
1. Tv/radio
2. doctor/nurse
3. newspaper/magazine
4. Friends
5. Others

Table 4D: Barriers of screening and suggestions to improve accessibility of screening

	Frequency	Percent	Valid percent	Cumulative percent
17. What were the factors which prevented you from undergoing the screening				
A	17	8.5	8.5	8.5
Ab	27	13.5	13.5	22
Abc	11	5.5	5.5	27.5
Abcd	20	10	10	37.5
B	24	12	12	49.5
Bc	10	5	5	54.5
Bd	13	6.5	6.5	61
Ab	12	6	6	67
Ad	15	7.5	7.5	74.5
Ac	15	7.5	7.5	82
C	15	7.5	7.5	89.5
D	13	6.5	6.5	96
Cd	8	4	4	100
Total	200	100	100	
18. What methods do you think will make screening more accessible to you				
A	47	23.5	23.5	23.5
Ab	80	40	40	63.5
Abc	2	1	1	64.5
Abcd	11	5.5	5.5	70
Ac	2	1	1	71
Ad	2	1	1	72
Bc	4	2	2	74
C	7	3.5	3.5	77.5
D	10	5	5	82.5
B	11	5.5	5.5	88
Bd	10	5	5	93
Cd	14	7.5	7.5	100
Total	200	100	100	

Key for Question 17
A. test
B. Test is costly
C. Don't know where is done
D. The centre is far from home
E. Any other reasons

Key for Question 18
A. Social media, TV, newspapers should give more information B. Financial assistance should be given
C. Reminder by the centres for testing
D. test to be available in rural centres also
E. Any other

Table 5E: Outcome of screening and vaccination

	Frequency	Percent	Valid Percent	Cumulative Percent
19. did the women accept screening after counselling				
Yes	155	77.5	79.1	77.5
No	25	12.5	12.8	90
Screened	2	1	1	91
Wants to do later	18	9	7.1	100
Total	200	100	100	
Total	200	100		
20. What was the outcome result of screening of the above women				
Negative	138	69	89	89
LSIL	15	7.5	9.6	98.7
HSIL	2	1	1.2	100
Invasive cancer	0	0	0	0
Total	155	77.5	100	
Not eligible for question	45	22.5		
Total	200	100		

21. Did she agree to vaccinate her daughter				
Yes	41	20.5	45.5	45.5
No	20	10	22.2	67.7
Later	29	14.5	32.2	100
Total	90	45	100	
Not eligible for question	110	55		
Total	200	100		

Results and Observation

A total of 200 participants were given the questionnaire who returned it after completing the questionnaire. 97% of the participants were aged between 45–60 years, married [85%] with majority belonging to the hindu [71%] community residing in rural areas [60%] of Bihar. [Table A]

To the question 'have you heard of cancer cervix' only 61 [30%] participants responded that they knew about it [Table 2, Q1]. Those who were aware of cancer cervix proceeded with further questions about cancer cervix. Out of 61 participants, 54% knew it takes many years for the cancer to develop [Table 2, Q2] and 20% believed cancer cervix as a preventable disease [Table 2, Q3]. 75% had knowledge of post menopausal bleeding as symptom of cancer cervix [Table 2, Q4]. 9 out of 61 participants agreed HPV as a cause of cervical cancer [Table 2 Q5]. 7 agreed that if detected cancer cervix can be cured [Table 2 Q6]

Of the 200 participants only 45[22.5%] knew about pap smear as screening modality of cervical cancer [Table 3, Q7]. 26[13%] of them heard about it from doctors and only 1 % from TV/Radio [Table 3, Q8]. Out of 45 participants who knew about pap smear, 80 % of them did not undergo pap smear [Table 3, Q9] and among the 20 % who had undergone pap smear only 57% have undergone it two times [table 3, Q10] When the participants were asked "whom do they prefer to take pap smear test" 93.3% preferred gynaecologist to do it [Table 3, Q11]. When asked if they would undergo the test in future 165 participants agreed [Table 3 Q12].

37 participants [18.5%] were aware of HPV vaccine [Table 3, Q13]. When asked from where they heard about the vaccine 10% stated from doctors and 1 % from TV [Table 3, Q14]. 3 participants knew there were 3 doses of vaccine [table3 Q15].83% were unsure if they have to undergo pap test even after vaccination [Table 3, Q16]. Major concern for lack of vaccination was its safety and cost.

When asked the reason for not undergoing pap test majority of participants told inadequate knowledge, not enough information about the test to be the main reason [12%]. Along with the above reasons, many participants did not know about the test and were embarrassed as it involves private parts [33%] [Table 4, Q17] .When the participants were asked to give suggestions to make the pap test more accessible to them 40% agreed that social media like TV, newspaper to provide educational message and the government to provide financial assistance to those attending screening. [Table 4 Q18] In this study, 79% agreed to screening by pap test after counselling. [Table 5, Q19]. 15 out of 155 participants who accepted testing were positive for LSIL and were further subjected to further intervention[table5,Q20].When the participants were asked if they would give HPV vaccine to their daughter 41 agreed to it [Table 5 Q21].

Discussion

In this study, majority age group is 45-60 years. In this study 40% belonged to rural areas of Bihar, 18% of participants were illiterate with 50% being housewives suggesting education plays an important role in in knowledge and attitude towards cervical cancer and its screening. The various socio demographic data are shown on the [table1]

According to Shankarnarayan *et al*. [8] the World Development Report has cited education as an essential component to human health, stating that "Households with more education enjoy better health, both for adults and for children (a result that) is strikingly consistent in a great number of studies, despite differences in research methods, time periods and population samples". Women in developing countries tend to be poorly educated, which has profound ramifications for the total quality of their lives, ranging from healthcare access, to health-seeking behaviour, to the ability to generate income. In most societies they have a status subservient to men, with less control over family resources, minimal access to money and, in general, inferior social power.

In this study, 61 [30%] of participants had heard of cancer cervix [table2, Q1]. Aswathy *et al*. in their study also stated that women more than 35 years of age, having knowledge of screening for cervical cancer and Pap test were significantly more likely to undergo the Pap test [9].

Out of the 30%, 68% had knowledge that cervical cancer takes many years to develop [Table 2, Q2]. In a study by Rahman *et al*. [1] 49% of participants knew cancer takes long time to develop.

When the 61 participants were asked if cervical cancer is a preventable disease 69% agreed [Table 2, Q3]. In a study by krishnanevi *et al*. [10] 60.2% agreed cervical cancer is a preventable disease.

When asked if post menopausal bleeding as symptom of cancer, 86% of 61 participants agreed to it [Table 2, Q4] Uma devi *et al*. [7] in their study stated Illiteracy, no toilet or running water inside the house, not washing genitals after sexual intercourse, age at first sexual intercourse <15 years, more than two lifetime sexual partners and widowhood were associated with increased risk of cervical cancer. None of the participants had knowledge about the same.

9 out of 61 participants agreed HPV as a cause of cervical cancer [Table 2 Q5]. 7 agreed that if detected cancer cervix can be cured [Table 2 Q6]. Yu yang [11] stated only 19% knew about HPV and Krishnanevi *et al*. [10] also suggested in her study that 89% agreed survival chances increases if detected early.

When the 200 participants were asked if they had heard of PAP smear test, only 45 had a knowledge of it [Table 3, Q7]. 13% heard from doctors whereas only 1 % heard from tv or radio. [Table 3, Q8] Aswathy *et al*. [9] stated Media has a major share (55.8%) in disseminating information to the women.

When asked if undergone pap test 36 of 45 participants had undergone the test [table3,Q9] and 30 participants had undergone the test only once [table3,Q10]. 93% preferred gynaecologist to take the pap test [table3,Q11]. In a similar study by Aswathy *et al.* [9] though three fourths of the population knew that cervical cancer could be detected early by a screening test,only 6.9 per cent had ever done the Pap test.

In a study by Mishra *et al*. [12] 42% had no idea about pap smear with 59% not undergoing screening even once.

In this study 84% of 200 participants agreed to undergo pap test in future [table3, Q 12]. Uma devi *et al.* [7] found that majority of

women agreed for tests such as colposcopy, VIA and cryotherapy services after counselling by the nurses and other health care staff thus a moderate level of compliance with screening and treatment can be reached through appropriate service delivery mechanisms

Uma devi *et al.* [7] in their study also agreed that in the absence of a state policy on cervical cancer prevention, screening of asymptomatic women is practically absent, even among otherwise well-organized health care programs of the industrial and military sectors. Therefore there are no serious efforts for population based screening in the state.

In this study 37, [18.5%] were aware of HPV vaccine [Table 4, Q13] and 10% of them had heard from doctors about it [Table 4, Q14]. In a study by yang yu *et al.* [11], a total of 45 (14.75%) mothers were classified as having no knowledge related to HPV/HPV vaccine, 179 (58.69%) had low knowledge of hpv vaccine.

In Punjab, Education of the parents of class 6 girls about the benefits of the vaccine was done through the Punjab Edusat Society that has been established and functioning since 2008, providing quality education to government educational institutions. Pre-recorded information by medical professionals were given to parents and teachers. This resulted in 98% coverage of vaccines among the government schools thereby indicating high acceptability and compliance with intervention [13].

3 participants knew there were 3 doses of vaccine [Table 3 Q15]. 83% were unsure if they have to undergo pap test even after vaccination [table 3, Q16]. Major concern for lack of vaccination was its safety and cost.

When asked the reason for not undergoing pap test majority of participants told inadequate knowledge, not enough information about the test to be the main reason [12%]. Along with the above reasons, many participants did not know about the test and were embarrassed as it involves private parts [33%] [table 4, Q17] .When the participants were asked to give suggestions to make the pap test more accessible to them 40% agreed that social media like TV, newspaper to provide educational message and the government to provide financial assistance to those attending screening [Table 4 Q18].

Umar Ibrahim [14] in his study found that barriers toward screening were embarrassment, pain, or the procedure being bothersome. 40% of the participants suggested government to give financial support to attend screening and tv/radio as mode of stronger educational message to the people.

In this study, 79% agreed to screening by pap test after counselling. [Table 5, Q19]. 15 out of 155 participants who accepted testing were positive for LSIL and were further subjected to further intervention [Table 5, Q20]. When the participants were asked if they would give HPV vaccine to their daughter 41 agreed to it [Table 4 Q21]. In a study by Mishra *et al.* [12] 68% were accepted screening. Thus after counselling, good compliance among the participants was noted at the end of the study towards the screening of cervical cancer by pap test and also vaccinating their daughters.

Conclusion

Australia was the first country in the world to provide free HPV vaccine and also first to report reduction in genital warts incidence in the vaccinated population. In the U.K pap smear screening is a part of NHS and calls are given to women to come for screening. We recommend need for measures to call women to improve their turn up in screening.

The knowledge about cervical cancer has improved over the past decade from 12% to 30% [13] which is also supported by the index study but still a long way to go to eliminate cervical cancer as a public health concern

Despite existence of national guidelines the screening coverage in India is appalling and is mainly attributed to inequality between infrastructure, resources and outsized population. As a result, very often diagnosis of cervical cancer is based on opportunistic screening or after the onset of symptoms

By adequately employing the screening techniques the burden on the health care system can be reduced. In the absence of supporting government programmes the health care staff needs to actively screen for cervical cancer and spread need of HPV vaccination among school girls.

With the support of government, cytology can be provided at cheaper cost in rural areas to increase the rate of detection. The model used in Punjab can set as an example of successful vaccination among girls and spreading of awareness of cervical cancer among women

Needless to say, health education, promotion of condom usage and need to follow healthy hygienic practices is the most cost-effective approach in reducing the incidence of cervical carcinoma in resource-crunched societies like India. Cervical cancer control activities could be included in the existing 'reproductive and child health program.'

Social media needs to be exploited more in the spreading of good hygiene practises, importance of pap smear screening and early detection of cervical cancer. We recommend school demonstrations and lectures specific to need for HPV vaccinations among school girls and their parents needs to be amplified and included in the state curriculum.

Even though the percentage of women undergoing pap smear has improved over the past decade from 10% [13] to 20%, many women are still hesitant is undergo the test. We also found HPV vaccination knowledge gravely lacking with very less vaccinated girls. This can be curbed by actively involving mass media, political commitment by the government, adequate health care staff training, allocation of adequate resources for vaccine purchase and roll-out from state funds; ensuring vaccine preparedness by efficient audit and reinforcement of immunisation programme infrastructure; efficient organisation of transportation services for the vaccines and the participants; good intersectoral coordination; an overall positive attitude of parents and the wider community towards HPV vaccination.

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