



KNOWLEDGE, ATTITUDE, AND PRACTICE TOWARDS HPV VACCINATION AND PREVENTION OF CERVICAL CANCER AMONG WOMEN: A TERTIARY CARE HOSPITAL STUDY

Obstetrics & Gynaecology

**Bindu Vishnu
Raddi Gangal***

Department of Obstetrics and Gynaecology, ACS Medical College, and Hospital, Chennai, Tamil Nadu, India*Corresponding Author

**Vijayalakshmi
Gnanasekaran**

Department of Obstetrics and Gynaecology, ACS Medical College, and Hospital, Chennai, Tamil Nadu, India

**P.S. Jikki
Kalaiselvi**

Department of Obstetrics and Gynaecology, ACS Medical College, and Hospital, Chennai, Tamil Nadu, India

G. Ganitha

Department of Obstetrics and Gynaecology, ACS Medical College, and Hospital, Chennai, Tamil Nadu, India

ABSTRACT

Human Papillomavirus (HPV) is the most common sexually transmitted infection and it causes Cervical Cancer. Despite the availability of highly effective vaccines against HPV, the burden of this dreaded disease remains high. This study aims to comprehend the current HPV knowledge, attitude, and vaccination practices among women. **METHOD:** This Cross-sectional study was done over 3 months among 220 women attending Gynaecological OPD in our hospital. They were divided into 2 groups based on their educational status. Group A > 10th standard, Group B < 10th standard. This study aims to assess the knowledge, attitude, and practices on HPV infection, vaccination, and prevention of Cervical Cancer among women. **RESULTS:** There was better knowledge regarding HPV infection ($p = 0.009$) and practices regarding HPV vaccination ($p = 0.00001$) among study participants. However, knowledge regarding HPV vaccination (p -value 0.33), attitude regarding HPV vaccination (p -value 0.06), and KAP on PAP screening ($p = 0.7$) was poor. **CONCLUSIONS:** It was encouraging to find that, most had knowledge of HPV infection, Cervical Cancer. Knowledge and attitude regarding vaccination were poor, and acceptability would increase if the Government included HPV vaccination in the National Immunization Program. With more awareness campaigns and, the use of media the public would be more amenable. If the cost constraint is dealt with, this preventable disease can be controlled.

KEYWORDS

Cervical Cancer, HPV vaccination, HPV, Human Papilloma virus.

INTRODUCTION

Worldwide, the most common sexually transmitted disease is Human papillomavirus (HPV) infection¹. Most sexually active people harbor HPV infection, their immunity determines the manifestation of clinical disease². 20% of HPV infections have a long latency period, clinical manifestations range from genital warts to malignancy: with Cervical Cancer being the commonest³. Among 15 years old Indians, 8% of females, and 2.7% of males have had sexual intercourse. Also, the median age at first sexual intercourse was 17.8 years³. A survey in the United States by Dutta SD et al among 14 to 65-year-old women showed a high 35% prevalence of high-risk HPV infection among 14 to 19-year-old sexually active adolescents⁴.

As per 2023 ICO/IARC factsheet³, 15 years and older women comprising 511.4 million of the Indian population, are at risk of developing Cervical Cancer. In 2023, an estimated 123907 women were diagnosed with Cervical Cancer and 77348 died from the disease. Cervical Cancer is the 2nd most common cancer among Indian women. It is also the 2nd most frequent Cancer affecting women between 15 and 44 years of age. At any time 5% of women are estimated to harbor cervical HPV-16/18 infection. 83.2% of invasive Cervical Cancer in India is attributed to HPV 16/18⁴. These subtypes are linked to high mortality^[3-9]. The crude incidence rate for Cervical Cancer was 18.7% in 2023³.

A tedious long way remains to achieve WHO's 2030 target of 90 -70-90 in INDIA. Currently, <1% of our women are vaccinated and <2% have been screened as per NFHS-5⁵. HPV vaccination is our best defence to eliminate Cervical Cancer. The inclusion of the HPV vaccine in the national immunization schedule will pave the way to achieve WHO's magnanimous dream. Hence, it is crucial to have a strong nationwide understanding of HPV and vaccination-related knowledge, attitudes, and practices among the masses. This allows us to close the gap and improve policies for effective prevention of Cervical Cancer. Knowledge among people can be used to interpret HPV vaccination acceptance and uptake. Thus, this study aims to comprehend the current HPV knowledge, attitude, and vaccination practices among women.

MATERIAL AND METHODS.

ETHICAL CONSIDERATIONS: Approval from the institutional

ethical committee was taken and then the study was proceeded with. Written consent was obtained in the participant's local language.

STUDY DESIGN: Cross-sectional study.

STUDY DURATION: January to April 2024.

STUDY GROUPS: 220 women attending gynecological OPD were divided equally, based on their education status. Women who had graduated beyond the 10th standard were allotted to group A, Group B included women whose qualification was less than the 10th standard. Statistical sampling was done using the formula: $n = N \cdot z^2 \cdot p \cdot q / (E^2 (N - 1) + z^2 \cdot p \cdot q)$.

INCLUSION CRITERIA: All women >18 years of age.

EXCLUSION CRITERIA: Known case of Cervical cancer, history or known case of abnormal PAP smear/ HPV infection.

METHODS: Data collection was done using a pre-validated questionnaire. Sociodemographic factors such as age, education, marital status, socioeconomic status, and contraception use were noted. Eligible participants were assessed on their knowledge, attitude, and practice about HPV infection, vaccination, PAP screening, and its role in Cervical Cancer. Questions were asked in their local language for better understanding and filled by single medical personnel. The 30-item survey established by classical test theory and item response theory includes questions to assess knowledge, attitude, and practice was divided into 5 groups which were, knowledge regarding HPV infection, knowledge regarding HPV vaccination, attitude towards HPV vaccination, practices regarding HPV vaccination, and KAP on PAP screening. The participants answered "YES," and "NO," for each question.

STATISTICAL ANALYSIS: Data collected was analyzed using EPI INFO SOFTWARE, SPSS statistical package. A descriptive study, chi-square test was used to determine associations & a p -value of <0.05 was considered significant statistically.

RESULTS

This study was conducted at A.C.S Medical College among 220 women more than 18 years of age attending the Outpatient Department of Gynaecology. The awareness and outlook of Groups A and B were

assessed regarding HPV infection, vaccination, and Cervical Cancer.

In our study, most participants were between 35 to 45 years in Group A, and 25-35 years in Group B(See TABLE 1, CHART 1)

Table 1: Age Distribution Among Study Participants

AGE	GROUP A	%	GROUP B	%
15-25	19	17.20%	9	8.1
25-35	28	25.4	32	29
35-45	32	29	29	26.3
45-55	22	20	21	19.09
>55	9	8.1	19	17.2

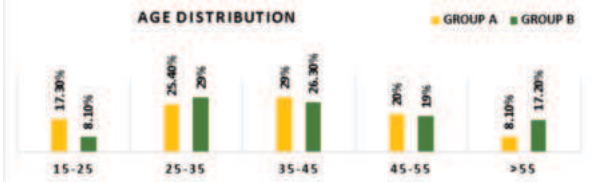


Chart 1: Age Distribution Among Study Participants

In Group A 72% of participants were urban dwellers and 28% rural dwellers. In Group B 48% came from urban areas and 52% from rural areas. In Group A 53.2% of participants belonged to upper socioeconomic status. 46.2% to lower socioeconomic status. In Group B 38% of participants belonged to upper socioeconomic status. 62% to lower socioeconomic status. 56% of Group A and 64% of Group B were married(See TABLE 2, CHART 2).

Table 2: Distribution Of Sociodemographic Characteristics Among Study Participants

SOCIODEMOGRAPHIC CHARACTERISTICS	GROUP A	GROUP B
URBAN	72%	48%
RURAL	28%	52%
UPPER SOCIOECONOMIC STATUS	53.80%	38%
LOWER SOCIOECONOMIC STATUS	46.20%	62%
MARRIED	56%	64%

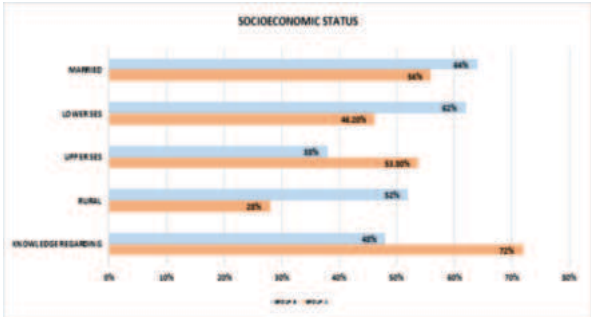


Chart 2: Distribution Of Sociodemographic Characteristics Among Study Participants

Among Group A participants 64.8% had knowledge regarding HPV infection which was more than Group B women (47.3%). Knowledge regarding HPV infection was statistically significant among both groups(p-value 0.009). See TABLE 3.

Table 3: Distribution Of Knowledge Regarding HPV Infection Among Study Groups.

KNOWLEDGE REGARDING HPV INFECTION	GROUP A	GROUP B	TOTAL	P VALUE
YES	71	52	123	
NO	39	58	97	
TOTAL	110	110	220	0.009*

Among Group A participants 43.8% had knowledge regarding HPV vaccination which was more than Group B women (37.6%). Knowledge regarding HPV vaccination was not statistically significant among both groups(p-value 0.3). See TABLE 4.

Table 4: Distribution Of Knowledge Regarding HPV Vaccination Among Study Groups.

KNOWLEDGE REGARDING HPV VACCINATION	GROUP A	GROUP B	TOTAL	P VALUE
YES	48	41	89	
NO	62	69	131	
TOTAL	110	110	220	0.3

Among Group A participants 30% had an attitude towards HPV vaccination which was lesser than Group B women (43%). Attitude toward HPV vaccination was not statistically significant among both groups(p-value 0.06). See TABLE 5

Table 5: Distribution Of Attitude Towards HPV Vaccination Among Study Groups.

ATTITUDE TOWARD HPV VACCINATION	GROUP A	GROUP B	TOTAL	P VALUE
YES	33	47	80	
NO	77	63	140	
TOTAL	110	110	220	0.06

Among Group A participants 62.4% had the right practices towards HPV vaccination which was more than Group B women (30.6%). Practices toward HPV vaccination were statistically significant among both groups(p-value 0.00001). See TABLE 6

Table 6: Distribution Of Practices Regarding HPV Vaccination Among Study Groups.

PRACTICES REGARDING HPV VACCINATION	GROUP A	GROUP B	TOTAL	P VALUE
YES	69	34	103	
NO	41	76	117	
TOTAL	110	110	220	0.00001*

Among Group A participants 45.8% had the right knowledge, attitude, and practices towards PAP screening for cervical cancer which was almost like Group B women (43.6%). KAP towards PAP screening for cervical cancer was not statistically significant among both groups(p-value 0.7). See TABLE 7

Table 7: Distribution Of Knowledge, Attitude, Practices Regarding Pap Screening For Cervical Cancer Among Study Groups.

KAP ON PAP SCREENING	GROUP A	GROUP B	TOTAL	P VALUE
YES	50	48	98	
NO	60	62	122	
TOTAL	110	110	220	0.7

Table 8: Distribution Of Knowledge, Attitude, And Practices Among Participants With Answer 'YES'.

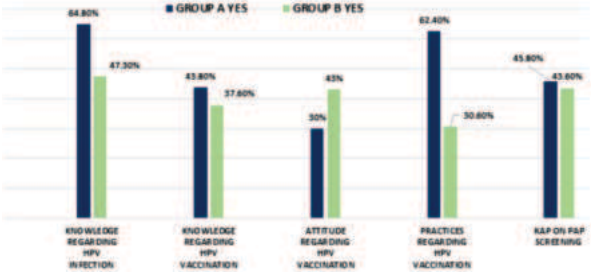
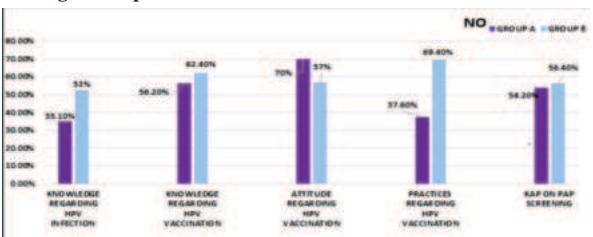


Table 9: Distribution Of Knowledge, Attitude, And Practices Among Participants With Answer 'NO'.



DISCUSSION

An understanding of public awareness, opinions, and practices is a fundamental requisite in the strategic planning and implementation of nationwide programs. Such a study provides valuable insight allowing us to improve the HPV vaccination uptake rate and achieve a Cervical Cancer-free society. It is a priority for a developing country like ours to increase vaccination uptake since we contribute a whopping 88% to the worldwide Cervical Cancer burden⁵.

In our study, most participants were between 35 to 45 years of age. In Group A 72% of participants were urban dwellers and 28% rural dwellers. In Group B 48% came from urban areas and 52% from rural areas. In Group A 53.2% of participants belonged to upper socioeconomic status, 46.2% to lower socioeconomic status. In Group B 38% of participants belonged to upper socioeconomic status, 62% to lower socioeconomic status. 56% of Group A and 64% of Group B participants were married. 20% of Group A and 16.3% of Group B participants used condoms as a barrier contraception method.

During the survey, we enquired if they were aware of Cervical Cancer, or HPV infection. 81.8% of Group A and 57.3% of Group B women were aware of Cervical Cancer. A significant difference ($P=0.00007$) was seen in the awareness aspect of these women. In a study by Jyoti Singh et al, 85% of respondents were aware of Cervical Cancer¹⁰. 70.9% of Group A and 43.6% of Group B women were aware of HPV and infections caused by it. A significant difference ($P=0.00004$) was seen between the groups. In a study by Villavicencio et al 90.9% were aware of HPV infections¹¹.

Participants were asked about HPV and its causal relationship with genital warts, and Cervical Cancer. Further, if there was a vaccination against HPV that could prevent them. 31.8% of Group A and 20.9% of Group B women were vaguely aware of the relationship. We found that there was no significant difference among the groups. In a study by Garland SM et al, participants were aware that HPV was associated with genital warts and precancerous cervical lesions¹². However, fewer women in both groups understood HPV infection and its role in Cervical Cancer. A poor knowledge level was seen regarding the association between HPV, genital warts, and precancerous lesions. Most of them even felt that it was very rare to develop HPV infections owing to Indian marital and monogamous practices. In Karnataka, India, a similar survey concluded that 50% of their respondents were aware, that cervical Cancer was sexually transmitted by HPV infection¹³.

In our study, 97.3% of Group A and 81.8% of Group B women felt that it was rare to develop HPV infections. In a study by A Seow et al, 58.9% participants thought that they would not develop HPV infection and cervical Cancer¹⁴. Also, 90% of Group A and 68.2% of Group B women felt HPV affected only women and men cannot develop HPV infection. There was a significant difference ($P=0.00006$). Most women were oblivious to the fact that HPV can infect men. The majority were ignorant that the early onset of sexual practices, promiscuity, and polygamy play a major role in the transmission of HPV and its causality of Cervical Cancer. Only 27.3% of Group A and 43.6% of Group B women expressed awareness regarding the fact that an individual can carry HPV infection without being symptomatic. There was no significant difference ($P=0.01$). Women were asked if they were aware that sexual activity at a young age increases the chances of getting HPV infection. 86.4% of Group A and 54.4% of Group B women had knowledge regarding this. There was a significant difference ($P=0.000002$). In a study by Jyoti Singh et al 32.4% of them were cognizant of the causal relationship between HPV and early sexual practices¹⁰. 64.5% of Group A and 51.8% of Group B women felt that HPV might get transmitted via oral sex. In my study, the participants expressed a lack of teaching about the etiology, sociodemographic risk factors, clinical presentation, prevention of HPV infections, and Cervical Cancer. In a study by Juntasopeepun et al, in Thailand the most common source of information was healthcare professionals¹⁵. This contrast was evident. Apart from certain private clinics and tertiary care hospitals, most small-bodied healthcare facilities lack services to provide HPV vaccination, hence there is a lack of counseling and education pertaining to HPV. Most of them who were aware owed it the recent budget and media hype with regards to India's locally made CERVAVAC vaccine. In Group A women 60.9% felt using a condom prevents transmission of HPV infections, and 39.1% disagreed. Among the Group B women, 47.4% agreed, 52.6% disagreed with this. There was a significant difference ($P=0.03$). A

study by Lam Ju et al inferred that 12% of participants felt that condoms can be used as the primary method to prevent HPV transmission¹⁶. Overall, Knowledge regarding HPV infection and its role in Cervical Cancer was statistically significant ($p\text{ value}=0.009$)

During the survey, we probed if the study participants had received any education regarding vaccination against Cervical Cancer. 59.1% of Group A and 39.1% of Group B women admitted that they had received some education regarding HPV vaccines from several sources. There was a significant difference ($P=0.003$). Among women who took our survey 13.6% of Group A and 20.9% of Group B women were aware of the approximate cost of HPV vaccines. The difference was not significant ($P=0.1$) Several expressed a high cost and poor affordability. Healthcare professionals played a very minimal role, as a source of their knowledge, in our study. Basu et al also reported via their study that, adequate counseling by healthcare providers at all levels, increased the acceptance rate of the HPV vaccine¹⁷.

When asked regarding the availability of vaccines to prevent Cervical Cancer, 77.3% of Group A and 36.4% of Group B women were familiar with it. A significant difference ($P=0.00001$) was seen. In a study by Villavicencio et al 93.1% were aware that vaccines were available against HPV and that they could prevent Cervical Cancer¹¹. Further, 41.8% of Group A and 34.5% of Group B women felt the HPV vaccine was efficient in the prevention of Cervical Cancer. The difference was not significant ($P=0.2$). Of the total respondents, 13.6% of Group A and 20.9% of Group B women had knowledge regarding the age group at which an individual can be vaccinated against HPV. The difference was not significant ($P=0.1$). Marlow et al observed that their study participants had shallow knowledge about specific aspects of the HPV vaccine, such as the recommended age group, and doses, efficiency profile¹⁸. In our study, 71.8% of Group A and 53.6% of Group B women felt that an individual could still develop Cervical Cancer despite vaccination. There was a significant difference ($P=0.005$). Overall, the knowledge regarding HPV vaccination was not statistically significant ($p\text{-value } 0.33$). Irrespective of educational status, a vast majority of our study groups were unaware of the 'who' and at 'what age' an individual could be vaccinated. They even felt that vaccination was for older and only sexually active women. They had poor comprehension of the vaccine particulars and its efficiency.

Bearing in mind the inclusion of the HPV vaccine in the national immunization program, 66.4% of Group A and 80.9% of Group B women strongly accepted it. The difference was significant ($P=0.01$). Group A was less inclined as they were more aware of vaccine accessibility. While Group B felt a dependency on the universal program. They also conveyed that its inclusivity would greatly boost coverage and increase vaccination rates. This would foster a widespread availability of the HPV vaccine to every nook and cranny of the Indian subcontinent, making it very difficult to miss the target population. A larger demand would even bring down the cost aspect hence making it widely acceptable even among lower socioeconomic groups. Our study made us aware that many felt it was not included in the national immunization program because it was not effective, it was risky, and there was inadequate research and public knowledge in terms of efficiency, side effects, and long-term hazard profile. During the survey, we asked them if they felt there was adequate research on the HPV vaccine. Among the Group A women only 19.1% and 37.3% group B felt the research was adequate. There was a significant difference ($P=0.005$). Largely they felt an inadequacy in HPV vaccine-related research. Among the Group A women, 14.5% felt the HPV vaccines were not safe, and 85.5% believed they were safe. Among the Group B women, 26.4% agreed, and 73.6% disagreed with this. There was no significant difference ($P=0.06$) Later, 9.1% of Group A women felt the HPV vaccine could be responsible for long-term health problems, and 90.9% disagreed with this. Among the other cohort, 24.5% agreed, 75.5% disagreed with this. There was a significant difference ($P=0.0005$)

We put forth a question, do you think that the HPV vaccine would be mandatory if it was so effective? Was it not made mandatory because it is risky? Among the Group A women, 60% agreed, and 40% felt it was not the reason. Among the Group B women, 51.8% agreed, 48.2% disagreed with this. There was no significant difference ($P=0.1$). Further among Group A 11.8% felt the vaccine was risky and hence not made mandatory, and 88.2% felt there may be other reasons. Among the Group B women, 34.6% agreed, 65.4% disagreed with this. There was a significant difference ($P=0.003$). Overall, the Attitude towards

HPV vaccination was poor (p-value 0.16).

On inquiry, 12.7% of Group A and 7.3% of Group B women had taken at least 1 dose of HPV vaccine. The difference was not significant ($P=0.1$). In a study by Olajide Akinnibosun et al 13.7% had taken at least 1 dose of HPV vaccine¹⁹. At the end of our survey we inquired, would you get vaccinated if it is included in the universal vaccination schedule? 85.5% of Group A and 37.3% of Group B women were willing to get vaccinated provided it was included in the immunization schedule. The difference was significant ($P=0.000001$). The non-willing participants were asked for a reason. Comparing Group A (33.6%) vs Group B (36.4%) felt that there was inadequate information regarding the vaccine. 6.4% vs 14.5% perceived the vaccination to be ineffective. 45.4% vs 40% were afraid of vaccine-related side effects and long-term health issues. 2.7% vs 1.8% had financial constraints. 19.1% vs 7.3% had other reasons. The difference was not significant ($p=0.04$). As per a study by Joshi et al¹⁰, there was poor acceptability of the HPV vaccine. 40.11% refused vaccination and 32.17% were still not sure. Their reasons included inadequate information, the high cost of the vaccine, the lack of cheaper alternatives, and unavailability. In a study by Kumari et al 79.17% agreed to vaccination, if it was in free supply²¹.

We proposed taking or recommending the vaccination at the end of the survey. 89.1% of Group A and 47.3% of Group B women were willing to do so. There was a significant difference ($p=0.000001$). The survey participants had a higher willingness for vaccination at the end of the survey probably because of the familiarity and mindfulness created just by the survey. Charakorn C. et al observed that participants of their study had a higher acceptance rate at the end of their study despite having low knowledge regarding the same²². In a similar study done in Kolkata, Basu et al reported that counseling and information by healthcare providers, increased the acceptance of the HPV vaccine¹⁷. Overall, practices towards HPV vaccination were statistically significant ($p=0.00001$). We enquired regarding PAP smear and if they were aware of its role in screening for cervical Cancer. Of the total respondents, 46.4% of group A and 45.4% of group B women were aware of PAP smear. The difference was not significant ($P=0.5$). Among the group A women 31.8% felt PAP smear helps in the prevention of cervical Cancer, and 38.2% agreed among group B. There was no significant difference between both groups. As such the total awareness about PAP smear and its use was subpar. In a community-based survey in Singapore by A Seow et al, 73.1% were aware of Pap smears and 51.3% of them felt it had a role in the prevention of cervical Cancer¹³. Group A 59% of women expressed a higher willingness to get a PAP smear done for annual screening of Cervical cancer as compared to Group B (47.2%) women. Overall, KAP towards PAP screening was poor ($p=0.07$).

CONCLUSION

Owing so much to the worldwide burden of Cervical Cancer, India has yet to implement integrated primary screening and universal immunization practices²³. A well-oiled coordinated effort from the government, healthcare professionals, and media is the need of the hour. A mere proposal and lack of inclusion of HPV vaccine in the universal immunization schedule halts our journey towards WHO's target and a Cervical Cancer free society. In likelihood, Dabash et al stated that healthcare providers were aware of the relationship between cervical Cancer and HPV, yet gaps in a comprehensive understanding of natural history, its preventable nature, detection, and early treatment of precancerous lesions prevented them from providing better services²⁴. Hence, proper training and knowledge among healthcare workers is a bare necessity.

HPV is fundamentally asymptomatic and subclinical, making prevention and early diagnosis not only difficult but challenging. This limits behavioral modification and brings about a large dependency on vaccination to prevent HPV-related infections and most importantly Cervical Cancer. In our study despite poor knowledge, the majority had an optimistic outlook towards HPV vaccination. A 29-article analysis, conducted in 13 Sub-Saharan African (SSA) countries, emphasized a higher inclination towards HPV infection, and prevention of cervical Cancer through vaccination despite poor knowledge. They reported a high success rate of HPV vaccination pilot programs, in six African countries, owing to formal school teaching, health care facility counseling, and nationwide sensitization programmes²⁵. Also, a government-sponsored, cheaper immunization program would have high receptivity and efficiency in the prevention of Cervical Cancer.

Overall, we were able to successfully assess HPV knowledge, screening, and vaccination practices among women. There was a clear relationship between educational status and better knowledge, attitude, and practices of women concerning HPV vaccination and Cervical Cancer. Thus, further accentuating the need for education on all fronts to fully fathom the barriers and motivators of HPV vaccination in India.

Conflicts of Interest – Nil

Source of Support: Nil

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