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Original Research Article

An Audit of Knowledge, Attitude and Practice of HPV Vaccine among Health Care Providers in Tertiary Care Hospital

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Abstract:

Background: Human papillomavirus (HPV) is the one of the most common cause of sexually transmitted infections. In 2018, approximately 43 million individuals were infected with HPV. Vaccination against HPV is an effective way to reduce the transmission of infection irrespective of genders and can effectively combat cervical cancer prevalence.

Aim: the primary aim of this study is to assess the knowledge level about HPV, attitudes, and practices towards HPV vaccine among the young health professionals and students with the aim to identify areas that require additional attentions which may increase the acceptability of the vaccine among general population and reduce the disease burden.

Materials and Methods: This cross-sectional survey was carried out at MVJMC and Research hospital between August 2023 to August 2024, where 600 medical professionals /students were asked to fill a structured questionnaire that consisted of four extensive areas; socio-demographic characteristics, HPV knowledge, attitude, and practices regarding vaccination. The compiled data was then analyzed using descriptive statistics and the responses were summarized.

Results: A substantial majority (77.5%) correctly identified HPV as a common sexually transmitted infection, 89.3% believed there is a need for the HPV vaccine even for sexually inactive individuals. Awareness that almost all cervical cancers are caused by HPV was high in 54%. A majority (70.3%) correctly identified high HPV incidence in women in their thirties. Knowledge about the symptomatic nature of genital HPV was mixed. While 44.5% believed most people with genital HPV are symptomatic, 39.3% disagreed. Significant misconceptions were seen about genital warts, with only 41.5% correctly identifying that they are caused by the different HPV types than that of cervical cancer. Knowledge about the availability of HPV vaccines for both genders was high. Attitudes toward HPV vaccination revealed mixed sentiments. Cost concerns were significant, 22.9% with worrying about the vaccine's cost while majority being unaware of the same. 42.3% expressed willingness to provide education about HPV.

Conclusion: The study revealed generally good knowledge and positive attitude towards HPV vaccination among healthcare providers, with significant areas for improvement.

Keywords: HPV – human papilloma virus, cervical cancer, healthcare, vaccination.

Introduction

Human Papillomavirus (HPV) is a group of more than 200 related viruses, with more than 40 types easily transmitted through direct sexual contact. HPV is highly prevalent worldwide, affecting millions of people each year. Certain strains of HPV, particularly types 16 and 18, are responsible for approximately 70% of cervical cancers and a significant proportion of other anogenital cancers, including those of the anus, vulva, vagina, and penis, as well as oropharyngeal cancers [1]. The introduction of the HPV vaccine has been a milestone in the fight against HPV-related cancers. The vaccines, including bivalent, quadrivalent, and nonavalent versions, target the most common high-risk HPV strains. Clinical trials and real-world studies have demonstrated the vaccines' efficacy in preventing HPV infections and related diseases [2]. The World Health Organization (WHO) recommends vaccinating girls aged 9 to 14 years, as the vaccine is most effective when administered before the onset of sexual activity [3]. Health care providers play a crucial role in the uptake of the HPV vaccine. Their recommendations significantly influence patients' decisions to vaccinate [4]. Providers' knowledge, attitudes, and practices (KAP) regarding the HPV vaccine can determine vaccination rates. Knowledge about HPV and the vaccine, positive attitudes towards vaccination, and proactive practices in recommending and administering the vaccine are essential for high vaccination coverage [5]. Despite the proven benefits, several barriers hinder the widespread adoption of the HPV vaccine. These barriers can be classified into individual, societal, and systemic levels. At the individual level, health care providers may lack comprehensive knowledge about the vaccine's benefits and safety. Misconceptions and insufficient training can lead to hesitancy in recommending the vaccine [6]. Societal barriers include cultural beliefs, religious views, and general public misconceptions about HPV and the vaccine, often fuelled by misinformation [7]. Systemic barriers encompass issues such as vaccine availability, cost, and logistical challenges in delivering the vaccine, especially in low-resource settings [8]. Several studies have highlighted the variability in knowledge, attitudes, and practices among health care providers regarding the HPV vaccine. A study conducted in the United States found that while most paediatricians and family physicians were aware of the HPV vaccine, there were significant gaps in their knowledge about the recommended age for vaccination and the vaccine's long-term benefits [5]. In contrast, a study in Nigeria revealed that only a small proportion of health care providers had adequate knowledge about HPV and the vaccine, which affected their willingness to recommend it [9].

Tertiary care hospitals, which offer specialized medical care and serve as referral centres, are pivotal in the healthcare system. The practices and recommendations of health care providers in these settings can significantly influence public health outcomes. In tertiary care hospitals, providers often deal with complex cases, including those related to cancer treatment and prevention, making their role in HPV vaccination even more critical [10]. Given the importance of health care providers in promoting HPV vaccination, this study aims to audit the knowledge, attitudes, and practices of health care providers in a tertiary care hospital. The primary objective is to assess the current level of KAP regarding the HPV vaccine among these providers. Secondary objectives include identifying barriers to vaccine recommendation and administration, evaluating the correlation between demographic variables and KAP scores, and providing recommendations to enhance HPV vaccine advocacy and administration among health care providers.

Understanding the KAP of health care providers regarding the HPV vaccine is essential for developing targeted interventions to improve vaccination rates. By identifying knowledge gaps and barriers, healthcare administrators and policymakers can design educational programs, streamline vaccine delivery systems, and address misconceptions effectively. Ultimately, this will contribute to higher vaccination coverage, reduced HPV-related diseases, and improved public health outcomes [11].

Methodology

Study Design: The study was conducted as a cross-sectional survey.

Study Setting: The research took place in a tertiary care hospital MVJ Medical College and Research Hospital, Bengaluru. The hospital provided a comprehensive range of healthcare services and served as training sites for medical and paramedical students.

Study Participants: Participants included medical practitioners, students who were affiliated with the tertiary care centres.

Inclusion Criteria - specified that all medical personnel willing to participate were eligible.

Exclusion Criteria - Non-medical staff, nurses, those who are not willing to participate in the study were excluded from the study.

Study Period – The research was conducted from August 2023-2024.

Study Parameters: The parameters of the study focused on the knowledge, attitude, and practice (KAP) of the HPV vaccine among healthcare providers. Specific parameters included demographic details, educational status, and views on the HPV vaccine.

Study Data Collection: A self-constructed detailed questionnaire which was influenced by various studies was used for this study. The questionnaire was distributed via Google Forms to ensure ease of access and submission. 39 close ended questions with predefined options were given which were divided into 4 sections in the survey.

The first section – participant's demographic details including age, marital status, year of study, family history cervical cancer, receive HPV vaccine or not (4 items).

The second section was about participants knowledge about HPV in general on a 3-point liekart scale (0 – don't know to 2 – true). On a 5-point liekart scale, participants were asked about awareness of HPV in female (section 2 table 2) (5 items) (1- strongly disagree – 5 – strongly agree). In addition, next section table 3 section 1 focussed on items about participant's attitude towards HPV vaccine on a 5-point liekart scale. Table 3 section 2 notes practice towards HPV vaccine which was tested on 5-point liekart scale (8 items). [12]

Participants were asked to provide their responses. A total of 600 responses were collected and its comprehensive analysis was done.

Study Data Analysis: Data collected from the questionnaires were compiled into an MS Excel spreadsheet. The compiled data were then analyzed using descriptive statistics to summarize the responses. The statistical software SPSS version 22 was used for further analysis. Graphs and tables were generated using Microsoft Word and Excel to present the findings clearly and concisely.

Ethical Considerations:

The study adhered to ethical guidelines and standards. Ethical clearance was sought from the institutional ethical committee of MVJ Medical College and Research Hospital.

Participants were informed about the purpose of the study, and their consent was obtained before participation. Confidentiality of the participants' responses was maintained throughout the study.

Result and Analysis

Table 1: Distribution of studied sample according to demographic data

	Number	Percentage
Age		
18-20	204	34%
21-23	341	56.80%
24-26	5	9.20%
Marital Status		
Married	7	1.2
Single	593	98.8
Year Of Study		
Fourth Year	80	13.3
Intern	29	4.8
Post Graduate Student	12	2.0
Second Year	235	39.2
Third Year	244	40.7
Family History Of Cervical Cancer		
I Don't Know	30	5.0
No	561	93.5
Yes	9	1.5
Did You Receive HPV Vaccine?		
No	551	91.8
Yes	49	8.2

Among 600 study participants, 56.8% were 21- 23 age group, 34 % between 18-20 years. 98.8% were identified as single and 1.2 % were married. Majority of the study participants were from second (39.2%) and third year (40.7%) of undergraduate MBBS degree course in India; respectively, indicating major focus mid academic levels. 93.5% reported no known family history of cervical cancer; 1.5 % confirmed having the family history of the disease. Among those with the positive family history, 32 respondents, 5.3 % indicated that the cervical cancer occurred in first degree relative, 1.0% reported in second degree relative, 3.0 % noted in third degree relative.

In term of study samples, ability to receive the HPV vaccine, it was found that 98.1 % did not receive the HPV vaccine, suggesting potential areas for increased educational outreach and vaccine efforts to boost the coverage rates.

KNOWLEDGE OF HPV Table 2- PART 1:

77.5% or 465 respondents believed that HPV is a common sexually transmitted infection. 54% acknowledged that HPV is positive agent in nearly all cases of cervical cancer, 30.8% do not believe and 15.2% are uncertain about the link between HPV and cervical cancer. 70.3% correctly agreed with item 3 that the incidence of HPV is highest among women in their 30s. 44.5% (for item 4) believe that most people with genital HPV are asymptomatic. 39.3% believe that most people with HPV show symptoms, while 16.2% were unsure about it, indicating a significant misconception about the nature of the virus. 41.5% correctly believe that different HPV types cause genital warts and cervical cancer. 218 incorrectly recognise that same types are responsible. The chi square tests underscore these discrepancies with pearson chi square value of 25.365 and a p value less than 0.001, highlighting a significant association between the believes about the commonness of HPV and the misconception about its implications.

Table 2: Knowledge of HPV in medical student's part 1

Knowledge of HPV	Correct Answer	Incorrect Answer
HPV is a relatively uncommon sexually transmitted infection	465(77.5%)	135 (22.5%)
Almost all cervical cancers are caused by HPV infection	324 (54%)	276(46%)
The incidence of HPV in women is highest among women in their 30s	422(70.3%)	178(29.7%)
Most people with genital HPV infections are symptomatic	267(44.5%)	333(55.5%)
Genital warts are caused by the same HPV types that cause cervical cancer	249(41.5%)	351(57.6)
Sexually active adolescents should be tested for HPV before starting HPV vaccination	252(42%)	348(58%)
HPV vaccine is not licensed for females older than 26 years of age	503(83.8%)	97(16.2%)
HPV vaccine is available for both females and males	484(80.7%)	116(19.3%)
Women and men who have been diagnosed with HPV should not be given HPV vaccine	403(67.3%)	197(32.7%)

Item – 6 investigates beliefs about the necessity of the HPV testing before vaccination. 26% support testing which is strongest when first degree relative is involved. Statistical validation through the chi square test shows significant differences in these beliefs, with a pearson chi square value of 13.571 and p = 0.009, suggesting beliefs about HPV testing are influenced by the proximity of the cancer in family tree. 97 providers incorrectly responded item 7 that vaccines are indeed not licenced for females over 26 , majority 400 correctly believe that vaccines are licenced while 17.2% were unaware about the same , chi square test reflects seriousness of these misconceptions, showing pearson chi square value of 28.675, p less than 0.001; indicating necessity for targeted educational efforts correct the misinformation. 484 acknowledged the availability of HPV vaccine in both genders, and the highest awareness regarding this was found in 21-23 age group. In contrast 18-20 and 24-26 age groups showed lowered levels of correct knowledge. P-chi—square value 22.262 and p value 20.001 indicating significant disparities. In the ratio and linear by linear association reinforces this significant trend, emphasizing the necessity of enhanced educational efforts to address these knowledge disparities among healthcare professionals. 32.7% of the individuals wrongly believed that people with HPV positive status shouldn't be vaccinated for HPV.

Table 3: Knowledge of HPV in medical students – part 2

Knowledge of HPV	Incorrect Answer	Correct Answer
Female are at risk for HPV infection	70 (11.6%)	530 (88.4%)
HPV infection is common among female	81(14%)	519 (86%)
Genital and anal warts can cause serious physical, emotional and financial consequences for female	123(19.5%)	477(80.5%)
Nearly all sexually active females have already been infected with HPV by age 26	527(87.3%)	73(12.2%)
HPV infections may contribute to anal, vulval, lining of the vagina, cervical and rectal cancers in females	124(20.7%)	476(79.3%)

A combined total of 530 respondents (261+269) 88.4% of participants believed that females are more susceptible to HPV infection, reflecting the widespread recognition of the elevated risk among females. 86% affirm that HPV infection in females is more common, reflects a well-established understanding HPV's prevalence among the female population. A small segment of the surveyed group holds contrary or uncertain views regarding the same. 477 respondents (80.5%) (343 and 134) strongly believe that genital warts can lead to serious physical, emotional and financial consequences for females. 73 (12.2%) of all the surveyed population correctly guessed that most females are infected by HPV by the age of 26 if they are sexually active. A significant majority, 476 respondents or 79.3% (377 agreeing, 99 strongly agreeing), affirm that HPV infection can lead to cancers (item 5) demonstrating a high level of awareness about HPV's serious health implications.

Table 4: Section 1 attitude of medical students towards HPV vaccine

Attitude Toward HPV Vaccination	Incorrect Answer	Correct Answer
We should vaccinate males against HPV in order to protect their future partners from cervical cancer and other	102(17%)	498(83%)
We already vaccinate females against HPV so there is no need to vaccinate males as well.	156(26%)	444(74%)
It would be important to vaccinate females against HPV to prevent them from getting genital and anal warts only	289(48.2%)	311(51.8%)
HPV causes too few cancers among females to make it worthwhile to vaccinate them	317(52.9%)	283(47.1%)
Vaccinating females does not make sense because genital and anal warts can be managed in other ways	152(25%)	448(75%)
It would be important to vaccinate females against HPV to prevent them from getting genital and anal warts prevent males from getting infected with HPV only	421(70.7%)	179(29.3%)
It is too late to vaccinate against HPV if an adolescent female is already sexually active	146(24.3%)	454(75.7%)

A majority (83%) supported vaccinating males against HPV recognising its role in preventing HPV transmission and associated cancers. However, 17% were unsure or disagreed, reflecting a need for further advocacy and education on the benefits of male vaccination.

Attitude towards HPV vaccination revealed mixed sentiments. While 26% of the population believed that only females if vaccinated, males need not receive the vaccine. A divided perspective was observed on the indirect benefits of female HPV vaccination. 51.2% believed the importance of vaccination as a preventive measure beyond just managing warts, having recognised the serious consequences of HPV virus in causing various types of cancers. 75 % correctly believed that just because the management of anal warts is simple, we should not skip HPV vaccine, which constitutes majority and says that understanding regarding the uses of vaccine was good.

283 of the study population were against the idea that HPV vaccine is worthless. 75.7% of the population believed that even of the female is sexually active, we should administer the HPV vaccine.

Table 4: Section 2 attitude of medical students towards HPV vaccine;

Attitude Toward HPV Vaccination	Incorrect Answer	Correct Answer
I feel that the vaccine is too new and "hasn't been around long enough"	296(49.3%)	304(50.7%)
I am concerned about the safety of HPV vaccine	305(51.8%)	295(49.2%)
I am concerned about the efficacy of HPV vaccine	327(54.5%)	273(45.5%)
I am opposed to HPV vaccination for moral or religious reasons	101(16.9%)	499(83.1%)
I am unaware that the vaccine is available for both males and females	230(38.4%)	370(61.6%)
I am concerned about the cost of the vaccine	443(77.1%)	137(22.9%)

Additionally, concerns about that novelty and safety of HPV vaccine were notable, with 50.7% expressing reservations about its novelty (newness) and 49.2% concerns about its safety.

45.5% expressed concern regarding efficacy. Majority of participants were aware that HPV vaccine was available for both genders, and were not opposed regarding religious or moral grounds. Cost concerns were significant was majority 206(34.3%) were unsure about the cost, while 22.9% expressing worries about the vaccine cost.

This highlights the need for discussion on vaccine affordability and potential subsidisation to improve up take.

Table 5: Section 3 practice of HPV vaccine among the medical students

Practice related statements regarding HPV	Incorrect Answer	Correct Answer
Ideal time for vaccination	183(13.8%)	517(86.2%)
Doses of HPV vaccine required	237(39.5%)	363(60.5%)
What HPV vaccines are available in India	267(44.5%)	333(55.5%)
route of administration of HPV vaccine	94(15.7%)	506(84.3%)
Contraindication HPV vaccine	162(27%)	438(73%)
Is there any booster required for HPV vaccine?	145(24.2%)	455(75.8%)
After how many years should we should take booster.	187(31.2%)	413(68.8%)
I will provide education to both males and females.	346(57.7%)	254(42.3%)

There was a good knowledge about ideal timing of HPV vaccine with 49% correctly identifying up to 26 years as ideal while 37.2% correctly saying to start vaccination between 9 to 15 years of age . However, 13.8% were unsure or selected other options. Similarly, there was clear understanding of the number of doses required, with 60.5% correctly identifying two doses and a booster. Knowledge about HPV vaccine availability in India was good with 55.5% aware of all the available vaccines. However, 44.5% were unsure or misinformed, indicating for clearer communication about the vaccine options. The root of administration was well understood with 84.3% correctly identifying intramuscular injection as the route. Awareness of contraindications were high, with 73% correctly identifying relevant contra indications like pregnancy and immunocompromised state. However, 27% were unsure or selected incorrect options, highlighting the area for improvements. Finally, there was good understanding of the need for boosters, with 75.8% aware of it while 68.8% identified its timings as 6-12 months. 42.3% expressed willingness to provide education about HPV vaccine. 60.7 % (400) that is a majority, responded as they will think about HPV vaccine after some years once it's more common in the world, reflecting very few people being completely confident about the vaccine, which is alarming as still healthcare workers need to be influenced regarding the positive aspects of the vaccine.

Discussion

Cervical cancer is a significant health issue particularly in developing countries like India. The journey towards its elimination began earnest in 2018 on the official side. Dr Tedros Adhanom Ghebreyesus, then WHO director general, unveiled a board plan to eradicate cervical cancer, establishing the 90-70-90 target for 2030. This goal mandates that 90% of eligible girls be vaccinated, 70% of eligible women undergo high performance tests at least twice by the age of 35 and 45 years, 90% of women who test positive receive treatment including palliative care [13]

Keeping this goal in mind, our study aimed to assess the knowledge, attitude and practice (KAP) of HPV vaccination among health care providers in tertiary care setting. The detailed analysis of the data revealed significant insights into the understanding and perceptions of HPV and its vaccination among medical practitioners and students. 56.8% of a study participants belong to 21 to 23 years and 34% belong to 18 to 20 years, which is similar to a study by Seemitha Shetty et al. [14] Regarding knowledge of HPV , 77.5%% of the participants responded that HPV is a relatively common sexually transmitted infection, 54% acknowledged that HPV is the causative agent in nearly all cases of HPV infection and 70.3% correctly agreed that highest incidents of HPV is seen in women in their 30s. The current study revealed that slightly higher level of knowledge regarding the HPV vaccine that Saudi Arabian study by Abdelaliem et al [12]

Majority of a study, 83 % supported vaccinating males, recognising its role in preventing HPV transmission, however in Shetty study, 64.4% indicated that both males and females should be vaccinated [14] 75.7% of our respondents did not believe the notion its too late to vaccinate an adolescent after sexual debut which was close to study by Jyoti et al (71.7%) [15] Concern regarding novelty, safety and efficacy were expressed, which were notable. 50.7% expressed reservation about its newness, 45.5% efficacy concern and another 49.2% regarding safety. This indicates a need for appropriate knowledge, continued reassurance by dissemination of long term safety data which supports acceptability of the vaccine. The above were sited reasons for refusing HPV vaccination in a study by Weilin et al [16], where 39.3% had worried about its safety, 8.3% doubted its effectiveness, 12.7% other unknown reasons. Cost concerns were significant, with 22.90% participants expressed in our study , while 34.3% being unaware about the price ,compared to 10% expressing concern about high cost of Weilin study . Cost might also be a prominent barrier to vaccination and only one third of participants in Weilin study accepted self-pay for HPV vaccination (W.lin et al)

Cost is one of the key factors for vaccination hesitancy and acceptability in developing countries like India. Incorporation of cervical cancer vaccination in the universal immunization programme has been passed and awaited [17]

Our respondents have good knowledge regarding HPV vaccine practices with respective ideal time 86.2%, doses 60.5% and availability in India 50.5%, route of administration 84.3% and contraindications 73%. In a study by Pal et al, the pooled proportion of knowledge regarding the availability of the HPV vaccine was 22% with a 95% CI of 14% - 31%, pooled estimate of positive attitude towards the HPV vaccine has found to be 45% with a 95% CI of 33% - 57%. This pool estimates related to knowledge, attitude and practise may be improved after its inception in NIS (national immunization schedule) [18]

The health care providers can play an important role in promoting cervical cancer screening and knowledge about HPV vaccination [19] Yet > 40% lacked knowledge about HPV vaccination eligibility and number of doses to be administered as per age. Structured programmes need to be designed to incorporate proper understanding amongst the students mainly because they are the individuals who will be approached for seeking answers related to health care dynamics. Lack of awareness teachers, doctors of vaccination during schooling, especially during the target age group (9-14 years) also has been observed [20] Vaccine delivery through schools was found to be one of the effective strategies for vaccine delivery in Haryana and Sikkim [18]

In 2022, national technical advisory group on immunization recommended including the vaccine in the national immunization programme with a one-time catch-up for 9 -14 year adolescent girls, followed by routine introduction at age 9. [21] A single dose of HPV, offers similar protection against persistent HPV 16, 18 serotypes, as two to three doses leading to WHO recommendation for reduced dosing schedule as proved by studies, [21] New WHO sage guidelines of single dose are going to be a game changer [13]. Only 42.3% of the respondents expressed willingness to provide education about HPV vaccination, reflecting a positive attitude towards patient education and advocacy, however others were unsure or disagreed, suggesting, health care providers may need more support and resources to effectively educate the community. In the study by Jyothi et al, 80.47% were rather willing to educate about the same. Integrated teaching approach regarding HPV carcinogenesis vaccination and cervical cancer is crucial. Incorporating HPV education in college curriculum increased awareness of HPV vaccination amongst medical students [15]. At the same time knowledge and awareness levels in our study is higher than reported in Saudi Arabia [22]. In a study by Cheena et al only 47% of the respondents recommended young women to get vaccinated against HPV [23].

Similarly, 51.22% responded in a China study. Willingness may reflect knowledge acquired before the survey and/or knowledge gained upon reading the survey questions [24]. 89.3% of our respondents believe that there is a need for the HPV vaccine even for sexually inactive individuals, however 10.7% either disagree or ensure, suggesting some of them do not fully understand vaccine preventive benefits.

In a Qatar study, more than one third were not interested in recommending HPV vaccine despite good HPV knowledge. The real gap in awareness play a key role, could negatively affect the role of health care providers in advocating vaccination. The study also revealed misconceptions for not recommending, as the adolescents are not sexually active [25].

Hence, to achieve the 2030 goal, targeted education, curriculum implementation, incorporating into national immunization schedule with due consideration to address the gaps in the knowledge and attitude of health care providers at academic level by community activities, we can dream of improved public health and decreased cervical cancer burden.

Conclusion

The study revealed generally good knowledge and positive attitude towards HPV vaccination among healthcare providers, with significant areas for improvement. Misconceptions about the perveance and symptomatic nature of HPV, confusion about vaccine eligibility and licencing, concerns about cost and safety were notable. A low introductory price of vaccine making it more affordable and acceptable through national immunisation programs. These findings underscore the need for targeted educational interventions in school, colleges and at grass root level, clear communication about the guidelines, recommendations and efforts to address financial barriers to improve HPV vaccine uptake. By addressing these gaps involving voluntary organisations and non-governmental organisations, healthcare providers can better advocate for and implement HPV vaccine, ultimately reducing both the burden of HPV related diseases.

Limitations: Our study is a cross-sectional study conducted in a single tertiary hospital, so I findings cannot be generalised to entire healthcare professionals. Moreover, we did not use a standard scale for KAP model, with might impact accuracy and completeness of data collection and the effect of factors like impact of previous sexually transmitted diseases on HPV could not be assessed.

Implications of the Study:

The data can provide useful information to incorporate HPV related content for awareness among healthcare providers to design community programs and incorporating into medical undergraduate curriculum.

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