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AWARENESS ABOUT HUMAN PAPILLOMA VIRUS HPV AND ITS ROLE IN ORAL CANCER AMONG DENTAL STUDENTS

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ABSTRACT

BACKGROUND: Human papilloma virus HPV is a DNA virus that plays an important etiological role in a subset of oral and Oropharyngeal squamous cell carcinomas. Among more than 200 types, high-risk HPV-16 is most commonly associated with oral cancer, followed by HPV-18.

AIM: The present investigation sought to conduct an awareness of Human papilloma virus and the role it plays in oral cancer among dental students through a structured, self administered questionnaire.

MATERIALS AND METHODS: The instrument encompassed domains related to demographic characteristics, general knowledge about Human papilloma virus, awareness of HPV that includes vaccination, route of administration and diagnostic step, HPV's role in oral cancer and their preventive measures.

RESULTS: The results suggest that while general awareness is adequate, targeted educational interventions focusing on vaccination protocols, diagnosis and clinical management of HPV related oral lesions are necessary to strengthen the perception of future dental professionals in preventing and detecting HPV-associated oral cancer.

CONCLUSION: The survey demonstrates good overall awareness of HPV and its association with oral and Oropharyngeal cancers among dental students, particularly interns and senior students. However notable knowledge gaps remain regarding vaccine administration, high-risk HPV types, and specific diagnostic modalities, emphasizing the need for enhanced educational programs.

KEY WORDS: *Human papilloma virus, oral cancer, awareness of HPV, HPV vaccine, prevention of oral cancer.*

INTRODUCTION

Oral cancer, also known as mouth cancer, is a type of cancer that develops in the tissues of the oral cavity, including the lips, tongue, cheeks, gums, floor and roof of the mouth and sometimes oropharynx (back of the throat). It often appears as a persistent sore, lump, or patch that does not heal. In India, around 77,000 new cases and 52000 deaths are reported annually which is approximately one-fourth of global incidence. Various conventional clinical techniques such as physical and histopathological examination, staining, biopsy, spectroscopic and radiological techniques etc are used to detect oral cancer [1]. Upon early diagnosis, timely and proper treatment can be initiated that may improve the survival rate upto 90% [1]. Several etiological factors are tobacco, alcohol, viruses (human papilloma virus HPV), herpes simplex, HIV, Epstein-Barr(EBV), poor dental hygiene, radiation, hereditary syndromes (basal cell nervus syndrome, xeroderma pigmentosa), pre-Malignant conditions (lichen plants, tertiary syphilis, leukoplakia, chronic candidiasis, plumer-venson syndrome) and malnutrition. Indicators of oral cancer may consist of dysphagia. Odynophagia, neck swelling and sensation of numbness in the lips [2]. Awareness of these symptoms are crucial for early detection and optimal treatment outcomes. The cancer starts as a growth of cells in the mouth. It most often starts in cells called squamous cells. These are flat, thin cells that line the lips and the inside of the mouth. Most oral cancer are squamous cell carcinomas. Normal squamous cells become cancerous when their DNA changes begin growing and multiplying. The cancer cells might form a mass called a tumour. The tumour can grow to invade and destroy healthy body tissue. In time, the cancer cells can break away and spread to other parts of the body. When cancer spreads, its called metastatic cancer.

WHO introduced a paradigm shift in 2005 by recommending a change in the classification of precancerous lesions to "Potentially Malignant Disorders" (PMDs) [2]. Tobacco usage is a primary reason to the development of oral cancer. Smokeless tobacco is also found to be a major reason for oral and pharyngeal cancer with a high risk in women.

Other carcinogens that relate to the development of Oral squamous cell carcinoma OSCC include excessive alcohol consumption, certain viruses such as Human papilloma virus HPV types 16 and 18, prolonged exposure to UV light.

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Human papilloma virus HPV is the most common sexually transmitted infection. HPV is a small, non- enveloped, double stranded, circular DNA virus of the Papillomaviridae family [5]. There are more than 120 types of HPV. HPV-16 and HPV-18 are considered high risk subtypes due to their association with malignant tumours [5]. High risk HPV can cause lesions or cancer and low risk HPV causes warts. HPV is limited to the basal cells of stratified epithelium. It infects the epithelial tissues through micro-abrasions or other epithelial trauma that exposes segments of the basement membrane. The virus penetrates the penetrates the host cell and integrates into the host cell genome where it can replicate. The current classification of HPV infection is non-genital (cutaneous), mucosal or anogenital and epidermodysplasia verruciformis (EV) [5]. Other types of HPV can increase the risk of developing cancer. These cancers include cancer of cervix, vulva, vagina, penis, anus and oropharynx or the base of tongue and tonsils. HPV is transmitted through skin-to-skin contact, having vaginal, anal or oral sex with someone who has the virus [4].

Primary prevention of oral cancer consists in education of people on the limitation of behavioural risk factors, in discouraging tobacco usage and addiction and limitation of alcohol intake. The development of oral cancer is strongly associated with several modifiable and nonmodifiable risk factors, with tobacco and alcohol use being the most significant contributors. However, emerging factors such as HPV infection and dietary habits are increasingly recognised as important determinants of oral cancer risk [6].

Smokeless tobacco is also found to be a major reason for oral and pharyngeal cancer with a high risk in women. In India, epidemiologically, Kerala has the lowest incidence of oral cancer while West Bengal reports the highest. It is reported that out of 100 patients suffering from PMDs and oral cancer, the highest number of cases were presented by individuals aging between 31>50yrs [1]. In recent years, the occurrence of buccal mucosa cancer has been increased when compared to tongue in India. Diagnostic techniques that are non-invasive, rapid and easy-to-use are in huge demands [1]. Autofluorescence spectroscopy, brush biopsy, computed tomography, confocal microscopy, diffuse reluctance spectroscopy, DNA microarray, elastic scattering spectroscopy biopsy, enzyme assay, exfoliative biopsy, fine needle biopsy, Fourier transform infrared spectroscopy, high-performance liquid chromatography, histopathological examination, incisional biopsy, laser capture microdissection, magnetic resonance imaging, mass spectroscopy, physical examination, ultrasound, vital staining techniques, X-ray are the techniques used for detection of oral cancer [1].

In India, self-examination is one of the most effective methods for early diagnosis of oral malignancy. It is important for dentists to examine the entire oral cavity when performing routine dental care to pick up suspicious lesions.

With the rising incidence of oral cancers, especially in younger, non-smoking populations, it is crucial that dental students are equipped with accurate knowledge to aid in prevention, early detection and patient education. Dental professionals are on the frontline of detecting early signs of oral cancer. They play key role in recognising oral lesions, educating patients about HPV and its risks, promoting HPV vaccination, reducing stigma around sexually transmitted infections.

Oral squamous cell carcinoma is now treated surgically or with irradiation, although few unequivocal controlled trials of treatment methods have been conducted. Photodynamic therapy and chemotherapy have occasional applications. Clinics staffed by both surgeons and oncologists, and their support staff, usually have a consistent treatment policy and offer the best outcomes [7].

MATERIALS AND METHODS

A cross-sectional, questionnaire-based survey was conducted to evaluate the awareness about Human papilloma virus HPV and its role in oral cancer among dental students.

The survey was developed using Google forms and incorporated a structured questionnaire consisting of 15 close-ended and multiple-choice items designed to assess multiple domains, including demographic characteristics, oral hygiene behaviour, awareness and knowledge of Human papilloma virus, role of Human papilloma virus in oral cancer.

The questionnaire underwent content validation by subject-matter experts in Oral medicine to ensure clarity, relevance and comprehensiveness. Participation in the study was entirely voluntary, and no personally identifiable information was collected at any stage.

Informed consent was obtained electronically. The introductory section of the online questionnaire contained a detailed consent statement outlining the study's objectives, the voluntary nature of participation, assurances of confidentiality, and maintenance of respondent anonymity. Only those participants who selected the option "I agree to participate" were permitted to proceed with the questionnaire.

All responses were subsequently compiled and tabulated using Microsoft Excel and subjected to statistical analysis to view the awareness levels among dental students.

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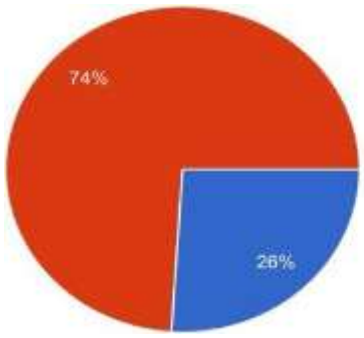
RESULTS

The present survey assessed the awareness and knowledge of dental students regarding Human Papilloma Virus HPV and it's role and Oropharyngeal cancer. The findings demonstrate that although a majority of participants possessed a basic understanding of HPV, important gaps in detailed knowledge still exist.

Most respondents were female and belonged to senior academic levels, particularly interns and final-year students indicating that the sample mainly represented students who are actively involved in clinical training. However, notable knowledge gaps were observed in specific clinical and practical aspects, including vaccine administration routes, diagnostic methods and identification of high-risk groups. A considerable number of respondents were unsure or provided incorrect answers to these questions, highlighting the need for improved clinical oriented teaching. Despite these gaps, most students acknowledged the importance of HPV knowledge for dental professionals, emphasizing a positive attitude toward learning and preventive practice.

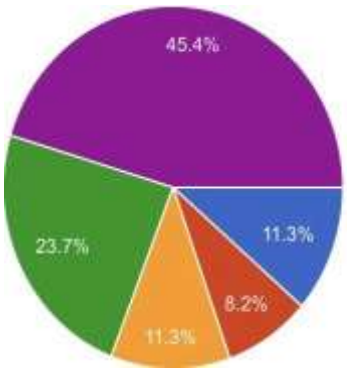
Overall, the results suggest that while general awareness is adequate, targeted educational interventions focusing on vaccination protocols, diagnosis and clinical management of HPV related oral lesions are necessary to strengthen the perspective of future dental professionals in preventing and detecting HPV-associated oral cancers.

Question 1: Age Details



74% female and 26% male. Indicates that the sample is female-dominant, with nearly three-quarters of the participants identifying as female.

Question 2: Year of Study



Majority 45.4% shows that interns make up the largest group, followed by 4th year students 23.7%. The remaining respondents are from 1st year 11.3%, 3rd year 11.3% and 2nd year 8.2%. This indicates that the sample is mainly composed of students in the later stages of their course, especially interns.

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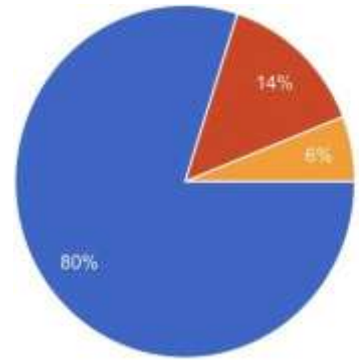
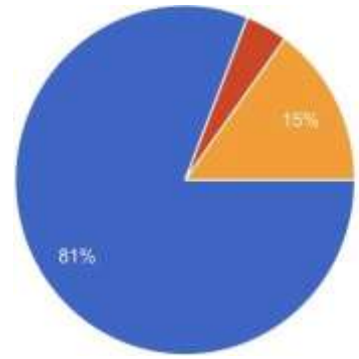
Question 3: Have you heard of Human Papilloma Virus?



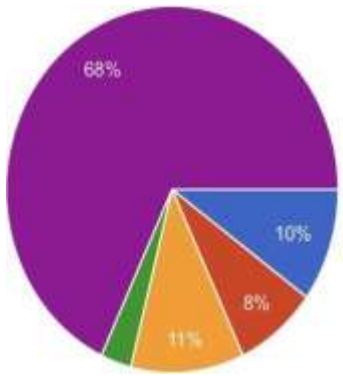
Most respondents 66% correctly recognised that HPV can cause multiple cancers, selecting "all of the above". Meanwhile, 21% identified oral cancer, 11% cervical cancer, and 2% Penile cancer individually. This indicates good overall awareness, though some participants still associate HPV with only specific cancer type.

Question 4: Can HPV affect areas of the oral cavity or oropharynx?



A large majority of the respondents 81% are aware that HPV can affect the oral cavity or oropharynx. However, 15% are unsure, and 4% believe it cannot. This indicates good awareness overall, but some respondents still lack clarity regarding HPV's impact on oral regions.

Question 5: What is the clinical appearance of HPV?



Most respondents 68% recognised that HPV can be present in multiple forms, selecting "all of the above". Smaller portions identified individual appearances such as flat warts 10%, genital warts 11%, common warts 8% and plantar warts 3%. This shows overall awareness of the varied clinical presentations of HPV.

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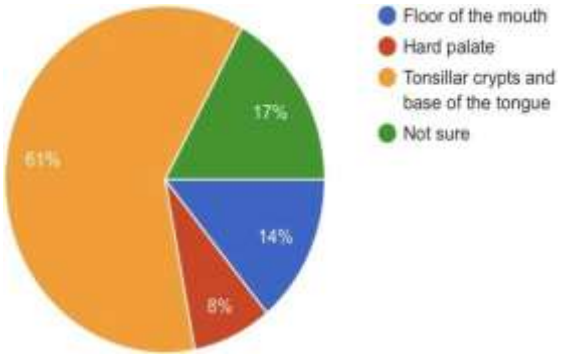
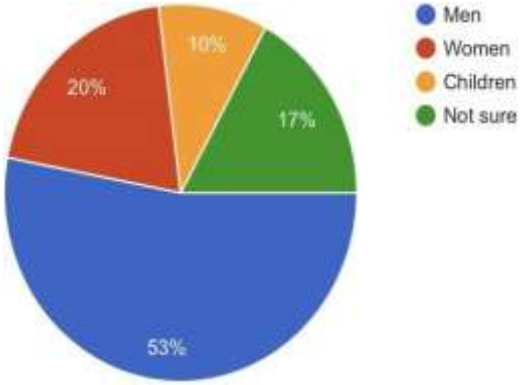
Question 6: Which is the most common site of HPV related Oropharyngeal cancer?



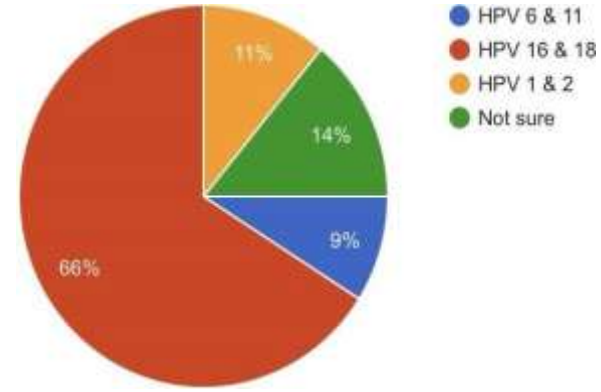
The majority of the respondents 61% correctly identified the tonsillar crypts and base of the tongue as the most common site for HPV-related oropharyngeal cancer. A smaller proportion chose the floor of the mouth 14% and hard palate 8%, while 17% were unsure. This shows good awareness overall, but some knowledge gaps still.

Question 7: Who is at high risk for Human Papilloma Virus?



More than half of the respondents 53% believe men are at higher risk for HPV. About 20% selected women, 10% chose children and 17% were unsure. This indicates a general understanding that HPV-related risks are higher in men, but some uncertainty and misconceptions still exist among the participants.

Question 8: What types of HPV are considered high risk for cancer?



Most respondents 66% correctly identified HPV 16 & 18 as the high-risk types associated with cancer. A smaller portion selected HPV 6 & 11(9%) or HPV 1 & 2(11%), while 14% were unsure. This indicates good overall awareness, though some confusion about low-risk vs high risk HPV types still exists.

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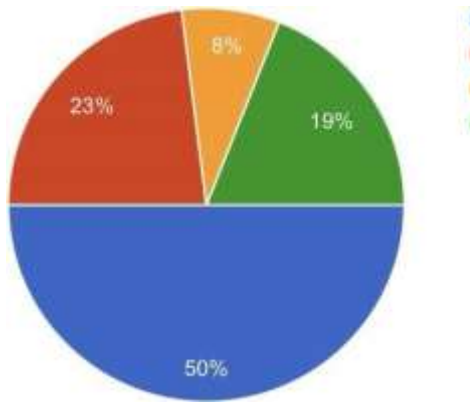
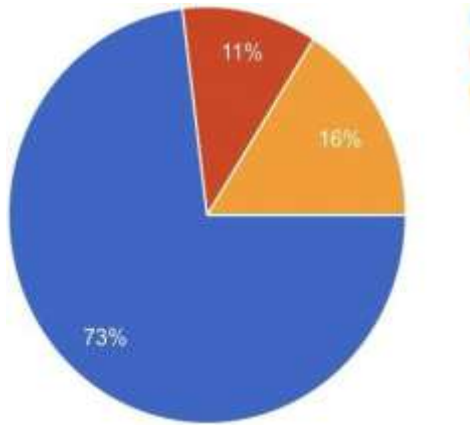
Question 9: What is the common HPV type associated with Oropharyngeal cancer?



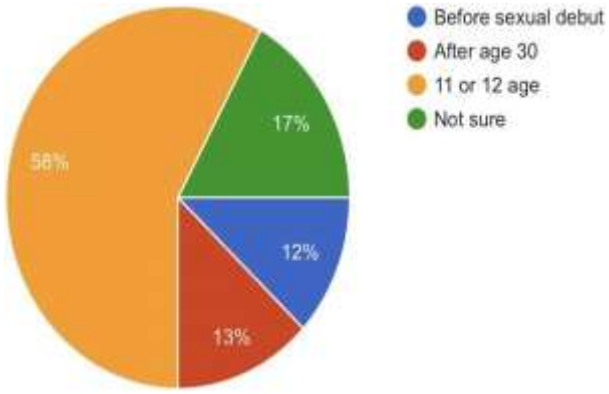
Half of the respondents 50% correctly identified HPV 16 as the most common HPV type associated with Oropharyngeal cancer. About 23% chose HPV 18, 8% selected HPV 1, and 19% were unsure. This shows moderate awareness, with some participants still unclear about the specific high-risk HPV type involved.

Question 10: Is there a vaccine available for HPV?



A large majority 73% correctly responded that an HPV vaccine is available. However, 11% believe there is no vaccine, and 16% are unsure. This indicates generally good awareness, though a notable portion still lacks accurate information about HPV vaccination.

Question 11: At what age HPV vaccine is most effective?



More than half of the respondents 58% correctly identified 11 or 12 years as the age when the HPV vaccine is most effective. Smaller groups chose before sexual debut 12% or after age 13%, while 17% were unsure. This indicates good awareness of the recommended vaccination age, though some confusion still exists.

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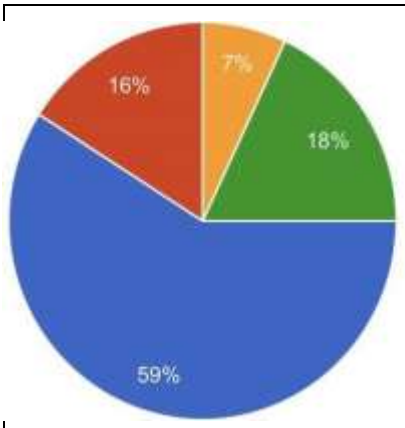
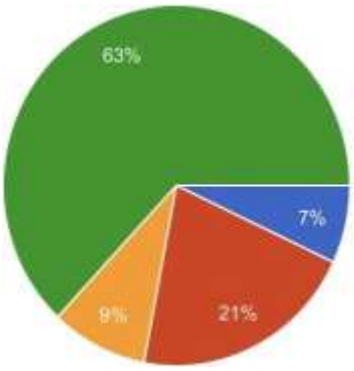
Question 12: What is the route of administration of HPV vaccine?



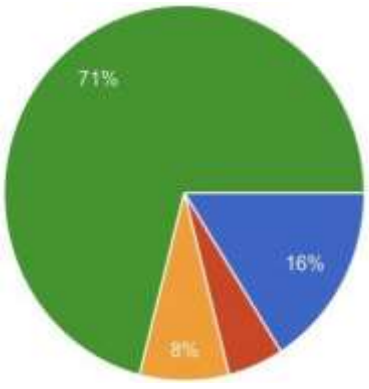
Most respondents 59% correctly identified intramuscular injection as the route of administration for the HPV vaccine. However, 16% incorrectly chose intravenous and 7% chose intradermal, while 18% were unsure. This indicates generally good awareness, but some confusion about the exact route still persists.

Question 13: How is oral HPV diagnosed in a clinical setting?



Most respondents 63% correctly answered "all of the above" recognising that oral HPV diagnosis in a clinical setting may involve visual/tactile examination, biopsy and PCR testing. Smaller groups selected individual methods-biopsy 21%, PCR 9% and visual/tactile exam 7%- showing that while many understand the combined diagnostic approach, some are aware only of specific techniques.

Question 14: How can HPV prevented?



Most respondents 71% believe that all combined measures vaccination, awareness and regular screening are the best way to prevent HPV. A smaller portion chose individual methods 16% vaccination, 8% regular screening and 5% awareness. This shows that the majority understand HPV prevention requires a multi-approach strategy.

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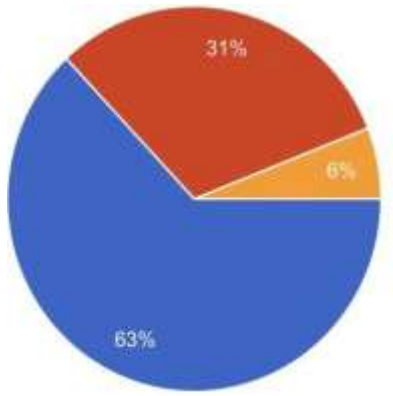
Question 15: Do you think it is important for dental professionals to know about HPV?



A majority of respondents 63% strongly agree that it is impostor dental professionals to know about HPV. About 31% remain neutral, while only 6% disagree. This indicates a strong overall belief in the importance of HPV knowledge within the dental field.

DISCUSSION

A high proportion of respondents had heard of HPV and were aware that it is a DNA virus and that it can affect the oral cavity and oropharynx. Additionally, the majority correctly recognised that HPV can cause multiple cancers and that tonsillar crypts and the base of the tongue are the most common sites of HPV-related Oropharyngeal carcinoma.

Encouragingly, more than two-thirds of the respondents correctly identified high-risk HPV types (16 and 18), the availability of HPV vaccination, and the recommended vaccination age group. Most participants also acknowledged that combined preventive strategies including vaccination, awareness and regular screening are necessary for effective prevention of HPV infection. Furthermore, a strong majority strongly agreed that knowledge of HPV is important for dental professionals, reflecting positive attitudes toward professional responsibility in early detection and prevention of HPV-related diseases.

The findings demonstrate that although a majority of participants proposed a basic understanding of HPV, important gaps in detailed knowledge still exist. However, despite generally good awareness, misconceptions were observed regarding vaccine administration routes, high-risk groups, specific diagnostic methods and certain HPV types associated with cancer. A considerable proportion of students were unsure or provided incorrect responses to these clinically significant aspects, highlighting deficiencies in detailed and practical knowledge.

Overall, the results suggest that while dental students demonstrate satisfactory general awareness of HPV and its oncogenic potential, there is a clear need for strengthened educational interventions, particularly focusing on vaccination protocols, diagnostic techniques and clinical management of HPV-related oral lesions. Incorporation of strict HPV-focused modules, continuing dental education programs and clinical workshops may help bridge these knowledge gaps. Enhancing knowledge at the undergraduate level will enable future dental professionals to contribute effectively to early diagnosis, patient education, vaccination protocols and ultimately to the reduction of HPV-related oral and Oropharyngeal cancer levels.

CONCLUSION

The present study assessed the awareness of Human papilloma virus HPV and its association with oral and Oropharyngeal cancer among dental students. The findings reveal that most participants demonstrated satisfactory general knowledge regarding HPV, it's oncogenic role, and its relevance to oral health. The study highlights that strengthening structured educational programs, workshops and continuing dental education on HPV can significantly improve student's knowledge for early detection, patient education and prevention of HPV-related oral cancers, thereby contributing to better public health outcomes.

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