

# Herpes labialis among dental healthcare providers in Nigeria

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## Abstract

**Introduction:** The epidemiology of herpes labialis has been relatively neglected. The objective of this study was to determine the prevalence and risk factors of self-reported herpes labialis among Nigerian dental health providers. **Materials and Methods:** This cross-sectional study of final year dental students and dentists undergoing postgraduate training at University of Benin Teaching Hospital, Benin City, Nigeria was conducted in June, 2014. The demographic information, lifetime and period (previous year) experience of the herpes labialis, perceived triggers and action taken during the last episode were obtained using a self-administered questionnaire. **Results:** The annual prevalence of herpes labialis was 7.4% while the lifetime prevalence was 22.1%. The lifetime prevalence was significantly associated with marital status, professional status and family history of herpes labialis. However, in binary regression, it was only marital status and family history of herpes labialis that emerged as the determinants of this lifetime prevalence. The most common trigger factors reported by the participants for the last episode of herpes labialis were fever, malaria, fatigue and stress. The actions taken by participants for the last episode of herpes labialis were using drugs without prescription (14.3%), application of lubricant (23.8%), nothing (57.1%) and could not remember (4.8%). **Conclusion:** Data from this study revealed that one out of fourteen and one out of five every studied dental healthcare providers had experienced herpes labialis in the last 12 months and their lifetime respectively. The reduction of fever inducing infections, stress and fatigue which were major triggers will help decrease herpes labialis among this studied group.

**Key words:** Dental healthcare workers, herpes labialis, prevalence

## INTRODUCTION

Herpes simplex virus-1 (HSV-1) and HSV-2 which are DNA viruses of *Alphaherpesvirinae* subfamily and *Herpesviridae* family, are the aetiological agent of HSV infections. These infections are among the infections most frequently encountered by humans, worldwide because humans are their only natural reservoirs, and no vectors are involved in their transmission. Although, these viruses can infect both orofacial and pubic areas, HSV-1 predominates in the orofacial region while HSV-2 in the pubic region.

Herpes labialis is the most common orofacial form of recurrent HSV infection. It is a common worldwide affliction on which neither public health procedures, vaccines, nor antiviral chemotherapy have yet had a

significant clinical impact.<sup>[1]</sup> Herpes labialis is a benign infective condition associated with the formation of vesiculo-ulcerative around the mouth which is often preceded by prodromal symptoms including pain, tingling and burning.<sup>[2]</sup> Although herpes labialis is generally associated with mild morbidity, frequent and/or severe recurrences remains a significant problem that impairs quality of life and impacts on healthcare consumption.<sup>[3]</sup> Rare complications like perioral scarring and depigmentation after healing of lesional areas may also occur.<sup>[2,4]</sup>

Herpes labialis is usually caused by reactivation of the nonreplicating dormant HSV-1 and sometimes HSV-2 in the trigeminal nerve ganglia.<sup>[5]</sup> However, it is the amplification of the preexisting activation that makes the condition, clinically visible. It has been reported that approximately one-third of patients who had initial HSV-1 viral infection undergo these recurrences at a rate of 1–4 recurrences per year which decrease

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after 35 years.<sup>[6,7]</sup> On reactivation, the dormant virus in the trigeminal ganglion resumes multiplication then moves down the trigeminal nerve to the site of initial inoculation to infect the epithelial cells causing a herpes labialis and this is considered as ganglion trigger theory.<sup>[8]</sup> The other, the skin trigger theory proposed by Hill and Blythe, holds that virus is continuously shed from neuronal endings and lesions develop when the susceptibility of the skin is sufficiently permissive for the development of a clinically apparent infection.<sup>[9]</sup> This attests to the existing controversy concerning the mechanism of development of recurrent HSV infections.

Investigators have not fully elucidated the triggers that allow the virus to emerge from its dormant condition to cause a recurrence. Nevertheless, several factors have been identified, such as ultraviolet light of both natural and artificial source as in sunlight and tanning beds, lip chapping, lip trauma or abrasion, fever, menstruation, fatigue, overexposure to wind, extremes of temperature, immunosuppression, dental procedures, iatrogenic trauma, dietary factor, upper respiratory tract infection, digestive problems, traveler's diarrhea, decompression of the trigeminal nerve, pregnancy, physical and emotional stress.<sup>[10-12]</sup>

The diagnosis of herpes labialis is usually based on case history, clinical appearance and the location of the lesions in immunocompetent patients while confirmatory laboratory diagnosis in form of viral culture, polymerase chain reaction, serology, direct fluorescent antibody testing, or Tzanck test may be necessary in immunocompromised patients.<sup>[7]</sup> However, prompt recognition of herpes simplex infection and early initiation of therapy are of utmost importance in the management of the disease as prompt topical or oral antiviral therapy are quite effective in decreasing the severity and duration of herpetic episodes and contributes to the prevention of recurrence of herpes labialis. The review of the literature did not reveal any report of the prevalence of herpes labialis infection among both undergraduate and postgraduate dental healthcare providers.

Hence the objective of this study was to determine the prevalence and risk factors of self-reported herpes labialis among Nigerian dental health providers

## MATERIALS AND METHODS

### Ethical clearance

The protocol for this study was reviewed and approved by the Ethics and Research Committee of University of Benin Teaching Hospital, Benin City, Nigeria.

### Study sample and sampling technique

This cross-sectional study was conducted among nontobacco using final year dental students and dentists undergoing postgraduate training (house officers and residents) at University of Benin Teaching Hospital, Benin City, Nigeria in June 20014. All the final nontobacco dental students and dentists undergoing postgraduate training were included because of their small number. However, it was only those present during data collection that were assessed.

### Questionnaire

The demographic information, lifetime and period (previous year) experience of the herpes labialis, perceived triggers and action taken during the last episode were obtained using a self-administered questionnaire.

### Data collection

The questionnaires were administered to the undergraduates and postgraduates at a regular scheduled class and postgraduate seminar respectively. The completed questionnaires were collected immediately afterward. Informed consent was obtained from the participants. Participation in the study was voluntary and no incentive was offered.

### Statistical analyses

The data obtained were subjected to descriptive and binary regression statistics using Statistical Package for the Social Sciences (SPSS version 17.0, Chicago, IL, USA). In the binary regression analysis, lifetime experience of herpes labialis was the dependent variable while demographic characteristics were the independent variables. Statistical significance was set at  $P < 0.05$ .

## RESULTS

The majority of the participants were >28 years, male, single, postgraduate healthcare workers, those without self-reported chronic medical condition and negative family history of herpes labialis [Table 1]. The lifetime prevalence was 22.1%. The lifetime prevalence was significantly associated with marital status, professional status and family history of herpes labialis. However, in binary regression, it was only marital status and family history of herpes labialis that were the determinants of this lifetime prevalence [Table 2]. The annual prevalence of herpes labialis was 7.4%. A total of 6 (85.7%) of participants that reported herpes labialis in the last 12 months had it, once while 1 (14.3%) of them had it, 4 times [Table 3]. The participants reported more than one perceived trigger factors and the most common trigger factors

reported for the last episode of herpes labialis were fever (61.9%), malaria (28.6%), fatigue (28.6%) and stress (28.6%) [Table 4]. The actions taken by participants for the last episode of herpes labialis were using drugs without prescription (14.3%), application of lubricant (23.8%), nothing (57.1%) and could not remember (4.8%) [Table 5].

## DISCUSSION

The prevalence of HSV infection worldwide has increased over the last several decades making it, a major public health concern. In this study, the lifetime

prevalence was 22.1%. This falls within the lifetime seroprevalence of 20–80%.<sup>[13]</sup> This is lower than 52.5% reported among Turkish nursing and midwifery students,<sup>[14]</sup> 30.2% among Ghanaian and South African health science undergraduates about four decades ago<sup>[15]</sup> and 26.4% among Jordanian university students.<sup>[16]</sup> This lower lifetime prevalence in present study may be due to the fact that all the dental healthcare providers in this study were nontobacco users. The socioeconomic status, race, and culture which are correlated with HSV infection may have differed in participants in this study with the compared studies thereby explaining the difference in the lifetime prevalence.<sup>[17]</sup>

The lifetime prevalence was significantly associated with marital status, professional status and family history of herpes labialis. However, the determinants of lifetime prevalence of herpes labialis were only marital status and family history of herpes labialis. This indicates that marital relationship and relationship in family increases contact and possibly the infectivity potential as both herpes viruses are transmitted across epithelial mucosal cells, as well as through skin interruptions. They then migrate to nerve tissues, where they persist in a latent state until activation by appropriate trigger. The higher prevalence of fever and malaria in married participants and those with positive family history of herpes labialis which were the dominantly reported triggers in this study may be an additional explanation [Table 4].

A noted common characteristic of herpes labialis is recurrence which may be frequent or infrequent. It has been reported that approximately one-third of patients who had initial HSV-1 viral infection undergo recurrences at a rate of 1–4 recurrences per year

**Table 1: Demographic characteristics of the participants**

Characteristics	Frequency n (%)
Age (years)	
20-22	1 (1.1)
23-25	9 (9.5)
26-28	33 (34.7)
29-31	18 (18.9)
>31	34 (35.8)
Gender	
Male	64 (67.4)
Female	31 (32.6)
Marital status	
Single	63 (66.3)
Married	32 (33.7)
Professional status	
Undergraduate	46 (48.4)
Postgraduate	49 (51.6)
Self-reported chronic medical condition	
Present	5 (5.3)
Absent	90 (94.7)
Family history of herpes labialis	
Negative	66 (69.5)
Positive	29 (30.5)
Total	95 (100.0)

**Table 2: Lifetime prevalence of herpes labialis among the participants**

	Ever experienced herpes labialis				
	Yes	No	P	OR (95% CI)	P
Age (years)					
≤28	6 (14.0)	37 (86.0)	0.082	0.804 (0.159-4.070)	0.792
>28	15 (28.8)	37 (71.2)			
Gender					
Male	13 (20.3)	51 (79.7)	0.545	0.796 (0.203-3.113)	0.743
Female	8 (25.8)	23 (74.2)			
Marital status					
Single	6 (9.5)	57 (90.5)	0.000	8.780 (1.354-56.945)	0.026
Married	15 (46.9)	17 (53.1)			
Professional status					
Undergraduate	6 (13.0)	40 (87.0)	0.039	0.557 (0.095-3.254)	0.516
Postgraduate	15 (30.6)	34 (69.4)			
Self-reported chronic medical condition					
Present	1 (20.0)	4 (80.0)	1.000	0.370 (0.026-5.164)	0.459
Absent	20 (22.2)	70 (77.8)			
Family history					
Negative	6 (9.1)	60 (90.9)	0.000	7.255 (2.146-24.523)	0.001
Positive	15 (51.7)	14 (48.3)			
Total	74 (77.9)	21 (22.1)			

OR: Odds ratio, CI: Confidence interval

**Table 3: The frequency of herpes labialis among the participants in the last 12 months**

Number of times	Frequency n (%)
Never	74 (77.9)
0	14 (14.7)
1	6 (6.3)
4	1 (1.10)
Total	95 (100.0)

**Table 4: Perceived triggers for the last episode of herpes labialis among the participants**

Trigger	Marital status		Family history of herpes labialis		Total n (%)
	Single	Married	Negative	Positive	
Fever	5	8	2	11	13 (61.9)
Malaria	1	5	1	5	6 (28.6)
Stress	0	6	3	3	6 (28.6)
Fatigue	1	5	3	3	6 (28.6)
Menstruation	1	1	0	2	2 (9.5)
Weakened immune	0	2	0	2	2 (9.5)
Upper respiratory tract infection	1	0	0	1	1 (4.8)
Intense sun exposure	0	1	1	0	1 (4.8)

**Table 5: Action taken by the participants during the last episode of herpes labialis**

Action taken	Frequency n (%)
Nothing	12 (57.1)
Application of lubricant	5 (23.8)
Drugs without prescription	3 (14.3)
Could not remember	1 (4.8)
Total	21 (100.0)

which then decrease after 35 years.<sup>[6,7]</sup> In this study, the annual prevalence of herpes labialis was 7.4% and the majority experienced it once while a few, more than once in the last 12 months. This is in consonance with Rooney *et al.*<sup>[18]</sup> report that stated that most patients experience <2 episodes of herpes labialis per year while 5–10% may experience  $\geq 6$  occurrences per year. This also indicates that herpes labialis occurs only in a subset of patients that have suffered primary HSV infection.

Antibodies to HSV-1 and HSV-2 increase with age starting in childhood and adolescence respectively reaching 50–80% in different socioeconomic status at the age of 30 years.<sup>[17]</sup> In the absence of cure and vaccine to prevent or eliminate the herpes infection at the moment, recurrence of herpes viral infection, most commonly as herpes labialis will occur in the presence of appropriate triggers because herpes virus have unique ability the virus to establish latency and undergo subsequent recurrence. The most common trigger factors reported by the participants for the last episode of herpes labialis in this study were fever,

malaria, fatigue and stress. It is not surprising that fever topped the reported trigger factors as infections that manifest as fever are very common in developing country like Nigeria. Malaria which is a specific and common fever causing condition was the second most common reported trigger among the participants. It has been reported that malaria can contribute to HSV-1 reactivation in the oral cavity by profoundly affecting the host immune system by mediating at the same time immunosuppression and immune hyper-activation.<sup>[19]</sup> The rating of fatigue and stress as the third and fourth common triggers respectively were noted and thereby confirms the widely documented stressful nature of dentistry.<sup>[20-22]</sup> The higher state anxiety and increased daily hassles and stressful life events have been found to influence herpes labialis and the suggested biologic mechanism is through the modulations of T-lymphocyte function.<sup>[23]</sup>

Treatments are available to reduce viral reproduction and shedding, prevent the virus from entering the skin, and alleviate the severity of symptomatic episodes. The treatment can be episodic or suppressive, depending upon the frequency and severity of episodes. In episodic therapy, it is essential that patients recognize prodromal symptoms for immediate self-medication. In this study, 14.3% used drugs without prescription while 23.8% applied lubricants. Although further assessment of the drugs were not done but they are likely analgesics and antibiotics which are the most common self-medicated drugs among dental healthcare providers which would have been taken to control associated pain and prevent secondary bacterial infection.<sup>[24,25]</sup> The use of lubricant will help in reducing discomfort associated with the condition and may also be helpful in preventing perioral scarring which is a rare complications of herpes labialis.<sup>[2,4]</sup> However, the usual mildness of symptoms and the self-limiting nature of the condition may explain why more than half (51.7%) of the participants that had herpes labialis did nothing.

Although the findings of this study may be limited by the fact that it is self-reported and could have been influenced by recall bias, assessment of prevalence using this method is acceptable in diseases with classical clinical presentation such as herpes labialis and can serve as baseline data which be compared with findings of other epidemiological studies that used the same study model.

## CONCLUSION

Data from this study revealed herpes labialis as a significant problem among the studied population. The reduction of fever inducing infections, stress and

fatigue which were major triggers will help decrease herpes labialis among this group.

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