



Gingival Health and Periodontal Diseases during Puberty in Females Students in Maal High School in Omdurman, Sudan (2021 – 2022)

Razan Hussien Abdelrahman Mohammed¹, Dalia Ahmed Gasm El Seed²

¹ University of medical science and technology Faculty of Dentistry

² Assistant Professor in Department of Periodontics, Programs of Dentistry, Napata College, Khartoum-Sudan

ABSTRACT

Published Online: February 08, 2024

Background: Periodontal health and diseases are influenced by sex hormones, puberty, menses, pregnancy and menopause. Gingival diseases modified by systemic factors that contribute to gingivitis such as the endocrine changes associated with puberty, the menstrual cycle, pregnancy and diabetes that may exacerbate the gingival inflammatory response to plaque.

Aim: To assess the effect of puberty on gingival health and periodontal diseases.

Material and Methods: descriptive cross sectional study, among 85 students, in Maal high school in Omdurman, Sudan .Data collected via self administer questionnaire completed for each students. Collected data was entered into the SPSS software (version 26). Data was analyzed and results presented as proportions in table and figures

Results: The results of this study showed that 95% of females students had a menstrual cycle, 60% had a good oral hygiene and 52.50% brush their teeth twice a day, majority of students 86.25% brushed their teeth, gum and tongue, 62.50% used a medium tooth brush, and 50% of females students had an oral feeling during menstrual cycle, however about 50% of females did not observe any symptoms in oral cavity.

Conclusion: This study indicated that hormonal changes occurring during the menstrual cycle influence the periodontium and induce inflammatory symptoms and signs

KEYWORDS: Periodontal diseases, Puberty, High school, Femal students.

INTRODUCTION

A variety of periodontal diseases and disorders impact children and teenagers. Gingivitis is a common condition, especially around puberty. Erythema, bleeding on probing, dull pain and edema are all signs and symptoms of gingivitis (1).

Gingivitis affects 50% of the population by the age of four or five years, and the incidence increases with age. Gingivitis is prevalent at about 100% during adolescence, although it gradually diminishes after puberty and remains stable throughout life (1).

Corresponding Author: Dalia Ahmed G. El Seed

**Cite this Article: Razan Hussien Abdelrahman Mohammed, Dalia Ahmed Gasm El Seed (2024). Gingival Health and Periodontal Diseases during Puberty in Females Students in Maal High School in Omdurman, Sudan (2021 – 2022). International Journal of Clinical Science and Medical Research, 4(2), 46-51*

Periodontal diseases are diseases processes involving the periodontium , a term use to describe the supportive apparatus surrounding the tooth , which includes the gingival tissues, alveolar bone , cementum and periodontal ligament(1).

Periodontal health and disease are influenced by sex hormones. Puberty, menses, pregnancy, menopause, and oral contraceptive use, for example, all have an impact on a woman's periodontal health(2).

Periodontal disease is caused by a complex interaction between the host's susceptibility and the micro flora of the oral cavity. The disease's prevalence, course, and severity may be influenced by a variety of systemic variables and circumstances in the host sex hormones, which are thought to play a role in the etiology of periodontal disorders(2). Hormonal changes exacerbate the gingival inflammatory response to plaque. This altered response appears to result from the effects of systemic conditions on the host's cellular

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and immunologic functions, but the primary etiologic factor is still considered to be microbial plaque (3).

Gingival tissues and the subgingival microflora are affected by increased hormone levels throughout puberty. *Prevotella intermedia* and *capnocytophaga* bacteria species, for example, develop throughout puberty, and there may be a hyperplastic reaction of the gingiva in areas where local bacteria deposits are present (2).

The inflammatory tissues develop a deep red color and may become lobulated, with the interdental papillae ballooning outward. Tissue appearance is consistent with inflammatory hyperplasia histologically. Furthermore, when patients masticate or brush their teeth, they may experience bleeding. In addition to puberty-induced changes, gingival tissues are more edematous during the menstrual cycle and erythematous before its onset. Consequently, increased gingival bleeding and exudation has been observed during the menstrual period and is sometimes associated with slight increases in tooth mobility(2).

There is increase in gingival diseases and inflammation among females during puberty that affect their life style and need proper oral hygiene.

The aim of our study was to assess the gingival health and periodontal diseases during puberty in females students in Maal high school in Omdurman, Sudan.

MATERIAL AND METHODS

We conducted a qualitative descriptive cross-sectional study among 85 Females students in Maal High school in Omdurman, Sudan. The inclusion criteria were the healthy

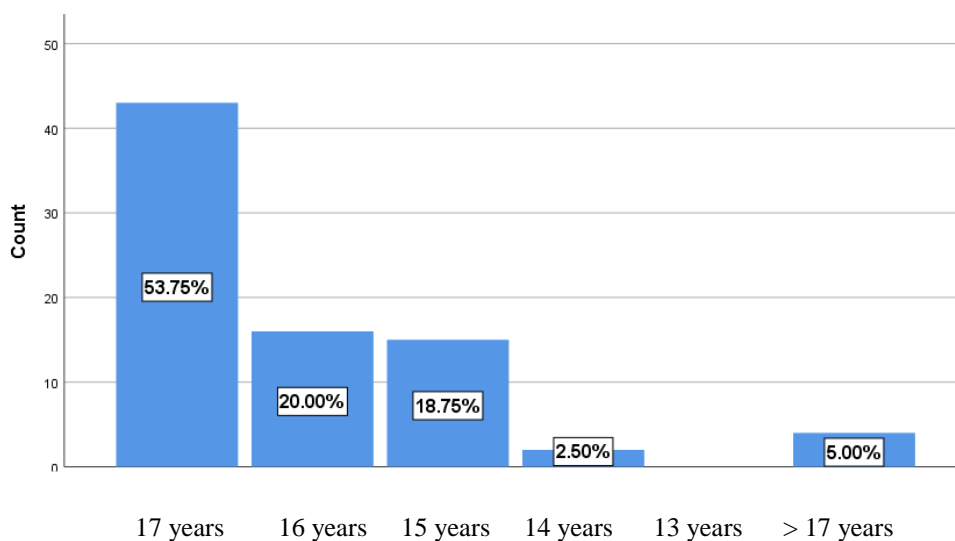
third year female's students between 13 and 17 years old who were willing to participate to this study and we excluded who refused to participate in the study. A designed questionnaire was used to collect data from study participants. We collected demographic variable such as age, then asked about menstruation, oral hygiene habits eg: brushing frequency, duration, if they clean gum, teeth and tongue, type of tooth brush, interdental aids used, the oral symptoms during menstruation and if they educated previously about oral hygiene method. Collected data was entered into the SPSS software (version 26). Data was analyzed with same software and results presented as proportions in table and figures. Ethical approval has been taken from SUMASRI institutional review board Anonymity, confidentiality and informed (verbal and written) consent were maintained in Arabic.

RESULTS

A total number of 85 female students in third year of high school were included in this study, 53.75% of students were in age 17 years old, and 95% of them had the menstrual cycle. Regarding oral hygiene 60% of the students said that they had good oral hygiene. When we asked about brushing, we found that 52.5% of students brushed once per day, 56.25% for five minutes, 86.25% brushed their teeth, gum and tongue and 62.5% with medium tooth brush. Regarding the interdental aids, 60% of students used interdental aids and 23.7% used interdental brush. 50% of females felt oral and periodontal symptoms during menstrual cycle and 23.75% of students complained from bleeding with brushing. 54% of females had an experience of education on teeth brushing.

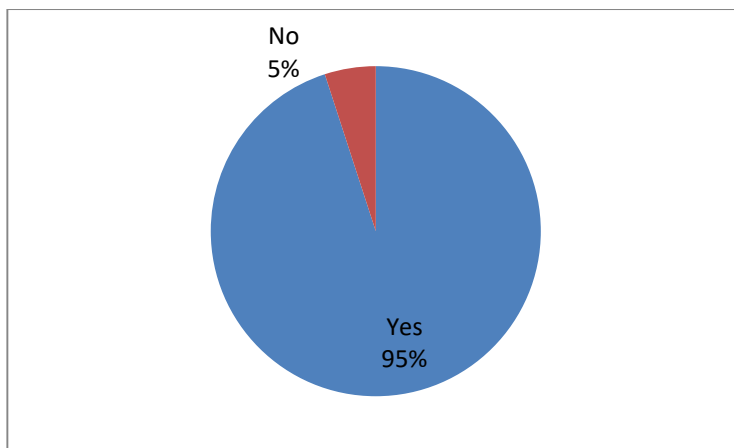
Results:

Age



Figures 1: Age of the females students

This figure shows that 53.75% of students were in age 17 years old



Figures 2: Menstrual cycle of the female students

This figure shows that 95% of females' students had menstrual cycle

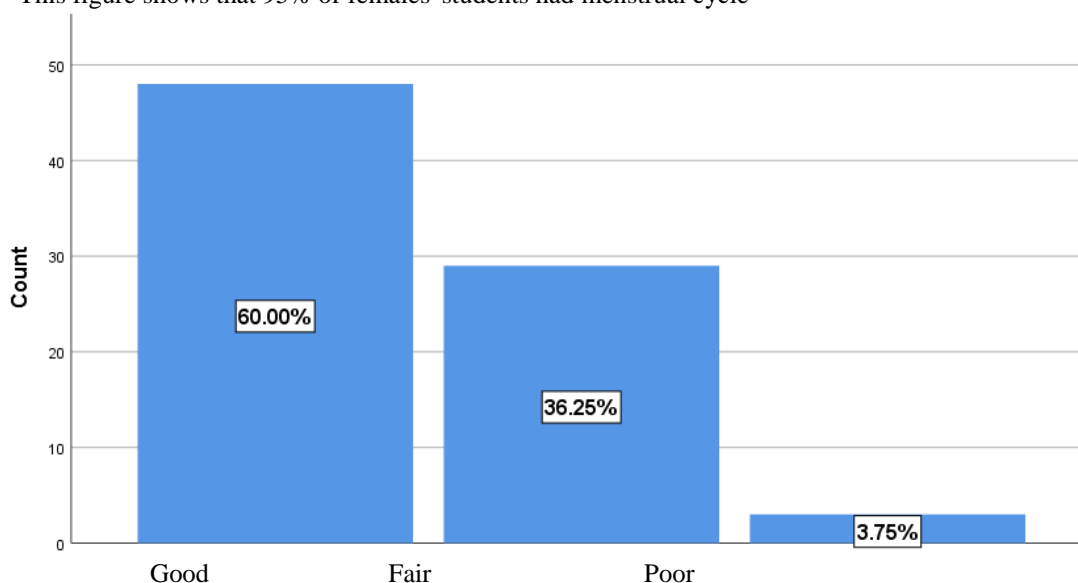


Figure 3: Oral hygiene of the female's students

This figure shows that 60% of the students said that they had good oral hygiene.

Table 1: Oral hygiene practice and habits (brushing)

Frequency of brushing	Once per day	Twice per time	Three time per day	Total Frequency / percent
	(38) 45.00%	(45) 52.50%	(2)2.50%	(85) 100%
Brushing Duration	One to two minutes	Five minutes	Up to ten minutes	(85)100%
	(26) 31.25%	(48)56.25%	(11)12.50%	
Region of tooth brushing	Teeth	Teeth and gum	Teeth, gum and tongue	(85)100%
	(5) 6%	(6) 7 %	(73) 86 %	
Types of tooth brush	Soft	Medium	Hard	(85) 100%
	(29)33.75%	(53) 62.50%	(3) 3.75%	

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This table shows that 52.5% of students brushed once per day, 56.25% for five minutes, 86.25% brushed their teeth, gum and tongue and 62.5% with medium tooth brush.

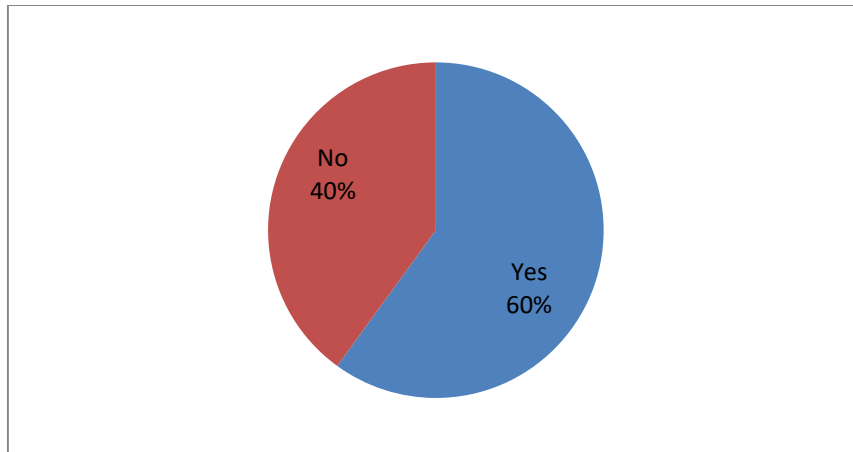


Figure 4: The using of inter dental aids by students

This figure shows that 60% of students used interdental aids.

Table 2: The interdental aids and mouth wash that used by students:

The interdental aids used and anti microbial mouth wash	Percentage %and frequency
Dental floss	8.5 % (7)
Interdental brush	23.75% (20)
Wooden picks	13.75% (12)
Mouth wash	14.00% (12)
Non user	40% (34)
Total	100% (85)

The table shows that 23.7% of female's students used interdental brush

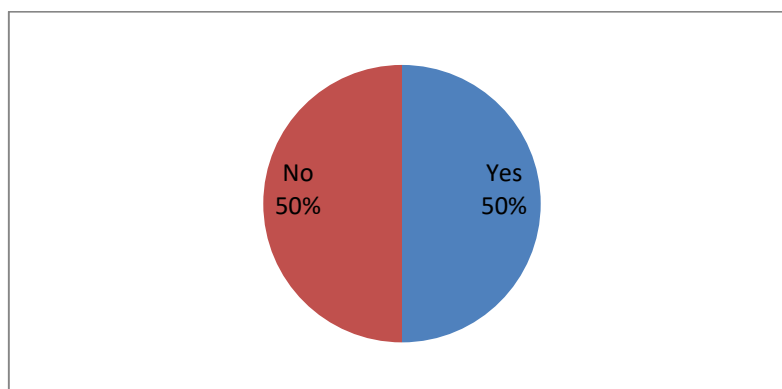


Figure 5: The oral and periodontal symptoms felt by females during menstrual cycle

This figure showed that 50% of females felt oral and periodontal symptoms during menstrual cycle

Table 3: Oral and periodontal symptoms during menstruation

Oral and periodontal symptoms	Bleeding with brushing	Swelling	Bad breath	Gum redness	Moblity	No symptoms	Total
%	23.75%	9 %	5%	11.00%	1.25%	50%	100%
Frequency	(20)	(8)	(4)	(9)	(1)	(43)	(85)

This table shows that 23.75% of students complained from bleeding with brushing.

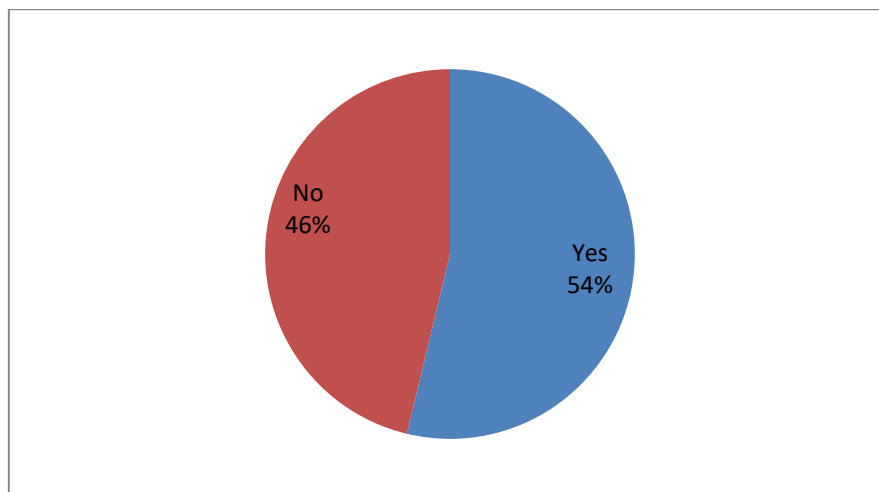


Figure 6: Experience of education on tooth brushing by females

This figure shows that 54% of females had an experience of education on tooth brushing

DISCUSSION

The present descriptive cross sectional study with a sample size of 85 students in (Maal high school) carried out to assess the effect of puberty on gingival health and periodontal diseases.

In this study we found that half of females students had an oral symptoms during menstruation this result was in agreement with result done by Gomes et al in DY patil University school of dentistry (2019) among adolescent girls which showed that 26% had complaining of tenderness and discomfort in their gum . And agree with our study in that more than half females students had an experience of education on tooth brushing and all students agree that their school conducts awareness programs for them regarding the oral health changes during menstruation(4) .

In our study we found that only 10% had gingival redness and 23.75% had bleeding during brushing this result was in disagreement with study done by Salvatore et al in Virginia common wealth University (2019) which showed that progesterone Effects on the menstrual cycle include induced inflammation of the gingiva as well as the gingiva having an erythematous appearance and bleeding on brushing (5). Study done by Khosravisamani et al in Quazin University of medical science on the effect of menstrual cycle on inflammatory cytokines in the periodontium found that gingival bleeding index increased significantly during menstrual cycle(6) . A review done by shinya Murakami in Osaka university in Japan (2018), found that most clinical studies have shown that there are only modest inflammatory

changes that may be observable during ovulation (7) .Also we found that only 9% of females had a gingival enlargements, this result was in disagreements with study done by Omar Riham in puberty associated gingival enlargement, which shows that the gingival enlargement coincided with the onset of puberty (8).

In our study we found that 60 % of female's students had a good oral hygiene because 52.50 % brush their teeth twice and 56.25% brush for 5 minutes. This finding was in agreement with study done by Mohamed Edrees et al ,in Egypt which found that 59.3% of the students perceived their oral health as good or very good, because 25.6% brush twice and 41% brush more than 2 minutes , only 10% used inter dental aids which is dental floss (9). Also in our study we found that more than half used inter dental aids mainly interdental brush this reflect their good awareness regarding their important in inter proximal plaque and food removal which preventing gingival and periodontal diseases.

CONCLUSION

Majority of females students with a menstrual cycle had a good oral hygiene, brushing their teeth , gum and tongue twice a day for a five minutes and half of them had no oral symptoms , however the other half feel an oral symptoms like bleeding with brushing during menstruation, most of students females had an experience of education on teeth brushing.

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This study indicated that hormonal changes occurring during the menstrual cycle influence the periodontium and induce inflammatory symptoms and signs.

RECOMMENDATION

We recommend making programs for education the young adolescent females students in high schools about the relationship between sex hormone and periodontal diseases and focusing on the importance of good oral hygiene and routine dental check up.

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