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The Prevalence and Severity of Periodontal Disease In the Medical Students at the University of Anbar and Their Attitudes to Oral Hygiene Measures

Zainab Abdulrahman Daher¹ , Ahmed Makki Al-Qarakhli, PhD² 

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this differs from our expectations, especially with a high social health status.

^{1, 2} Department of Oral Diagnosis, College of Dentistry, University of Anbar, Al-Anbar, Ramadi, Iraq.

<https://orcid.org/0000-0002-2588-4979>

Corresponding author: Ahmed Makki Al-Qarakhli

E-mail: den.ahmed.maki@uoanbar.edu.iq

Abstract: The study was a cross-sectional study of the fifth stage of medical, dental, and pharmacy students at the University of Anbar to assess periodontal health status. Objectives: To evaluate the periodontal status of medical students and to estimate their oral hygiene awareness. Materials and Methods A convenient sample of 75 students between the ages of 22 and 28 years old was examined to examine their medical history, dental history, smoking habits, oral hygiene measures, and relationship to oral health by measuring plaque index, gingival index, bleeding on probing, probing pocket depth, and clinical attachment loss. Results demonstrate no significant differences in the plaque index, gingival index, or bleeding on probing. While probing pocket depth and clinical attachment loss showed highly significant differences among males and females of pharmacy students, males of dental students, and females of dental students in the study groups. Conclusion

Keywords: Periodontitis, Oral hygiene, Medical students, University of Anbar

1. Introduction

Oral health plays a vital role in maintaining overall body health. The oral cavity is considered the gateway to the body and acts as a mirror of general health status (Alzammam and Almalki, 2019). Periodontal diseases, including gingivitis and periodontitis, are infectious diseases caused by bacteria found in dental plaque (Al-Batayneh et al., 2014). Interestingly, Periodontitis was more frequent among males than females. Several epidemiological studies have identified numerous risk factors for the manifestation and progression of periodontal diseases. These include age, gender, oral hygiene habits, frequency of dental visits, income level, educational attainment, residence place, cigarette smoking, diabetes mellitus, ethnicity, microbiological factors, genetic factors, immunity, social and behavioral factors, and psychological factors (Al Zarea, 2013). The importance of oral health is still a neglected and ignored social issue because most people are unaware of the relationship between oral health and systemic diseases. Therefore, there is significant emphasis on disease prevention rather than treatment. Hence, adequate awareness and knowledge about oral health and good oral hygiene practice will maintain good oral and general health. There is a common notion that educated people in society are more aware of the correlation between general health and oral diseases; however, there is insufficient data in the literature to prove this view (Al Batayneh et al., 2014). Gingivitis is limited to the marginal, supra-crestal soft tissues. It is manifested clinically by bleeding upon probing of the gingival sulcus, and in more severe cases by erythema and swelling, especially of the interdental papillae (Wolf et al., 2005). Periodontitis can develop from a pre-existing gingivitis. In the presence of risk factors and pro-inflammatory mediators, it might exaggerate inflammation, as well as the presence of a predominantly periodontopathic microbial flora. The gingival inflammation may then extend into the deeper structures of the tooth-supporting apparatus. The consequences include collagen destruction and loss of alveolar bone. The junctional epithelium degenerates into a "pocket" epithelium, which proliferates apically and laterally. A proper periodontal pocket forms; such a pocket is a predilection site and a reservoir for opportunistic, pathogenic bacteria; these bacteria sustain periodontitis and enhance the progression of the disease processes (Wolf et al., 2005). People responded differently to oral hygiene practices depending on their culture and social status. This study examines high-status groups, such as medical, dental, and pharmacy students. This research aims to evaluate oral hygiene and periodontal status, which are hypothesized to be good among those students.

2. Materials and methods

A cross-sectional study was conducted by distributing structured questionnaires for medical students at the University of Anbar. A convenient sample of 75 students of the last stage of medical, dental, and pharmacy students. The age is 22-28 years after obtaining their verbal consents. The questionnaire comprised a mix of multiple-choice questions on students' sociodemographic characteristics, including age, gender, university year of study, medical history, dental history, and oral hygiene measures. Furthermore, information on gingival health was obtained through an examination, including the plaque index. (Silness and L oe, 1964), gingival index, bleeding on probing (Newman et al., 2011), probing pocket depth (Newman et al., 2011), and clinical attachment loss.

Exclusion criteria

- 1.Smokers
- 2.Students with systemic diseases or on medications.

Calibration

The calibration of the examiner for clinical periodontal parameters (PI, GI, BOP, PPD, and CAL) was validated by:
1.Inter-examiner assessment: The clinical periodontal parameters of 5 students were measured by the researcher and the specialist in periodontics for 00 teeth simultaneously.

2.Intra-examiner assessment: The researcher examined clinical periodontal parameters among students. The examination was repeated twice on the same teeth at 2-hour intervals. Measurements obtained from inter- and intra-calibration showed significant agreement between the two observers for intercalibration and between the researcher and himself after 2 hours, ranging from 0.615 to 0.909, indicating moderate to strong correlation.

Clinical examination

Examination of each patient began by recording PI. The surfaces (mesiobuccal, buccal, distobuccal, mesiolingual, lingual, distolingual) of each tooth were examined by using a disclosing agent to detect the presence/absence of dental plaque. After disclosing all the tooth surfaces, participants were asked to rinse with water. The red and blue-stained surfaces were recorded as score 1, while the unstained surfaces were recorded as score 0. For recording BOP scores, six surfaces per tooth (mesiobuccal, buccal, distobuccal, mesiolingual, lingual, distolingual) were examined. The periodontal probe was inserted gently into the sulcus until no resistance was felt. If bleeding occurred within 30 seconds after probing, the site was assigned a score of 1; non-bleeding sites were assigned a score of 0. For recording GI scores, six surfaces per tooth (mesio-buccal, buccal, distobuccal, mesio-lingual, lingual, distolingual) were examined. If the gingiva is pink, no inflammation, no discoloration, and no bleeding, the site was given a score of 0. If the gingiva shows mild inflammation, slight erythema, minimal superficial alterations, and no bleeding, the site was given a score of 1. If the gingiva showed moderate inflammation, erythema, and bleeding on probing, the site was given a score of 2. If the gingiva showed severe inflammation, severe erythema and swelling, and a tendency to spontaneous bleeding, the site was given a score of 3. For recording PPD scores, six surfaces per tooth (mesio-buccal, buccal, distobuccal, mesio-lingual, lingual, distolingual) were examined. The periodontal probe was inserted gently into the sulcus until no resistance was felt. For recording CAL scores, six surfaces per tooth (mesio-buccal, buccal, distobuccal, mesio-lingual, lingual, distolingual) were examined, with measurements from the cemento-enamel junction to the clinical depth of the pocket.

3. Results

Plaque index (PI) is high in male medical students (1.063) and female students (1.043), followed by female pharmacy students (0.86) and male students (0.808). The lowest level is female dental students (0.697), then male (0.797, with a slight difference. However, not all groups are significant, $P > 0.05$. Table (3-1) and Figure (3-1).

Table (3-1): Plaque index in medical, dental, and pharmacy student groups according to gender.

Groups	Plaque index
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	Total	(Mean ± SD) Female	Male	P-value ≤ 0.05 P
Med No. (25)	1.052 ± 0.694	1.043 ± 0.693	1.063 ± 0.726	0.946
Den No. (25)	0.745 ± 0.415	0.697 ± 0.465	0.797 ± 0.366	0.55
Pha No. (25)	0.835 ± 0.433	0.860 ± 0.461	0.808 ± 0.419	0.769

P: T-test between Female and Male, SD: Standard Deviation
 (P ≤ 0.05): Significant (P > 0.05): No significant
 Med: medical, Den: dental, Pha: pharmacy students

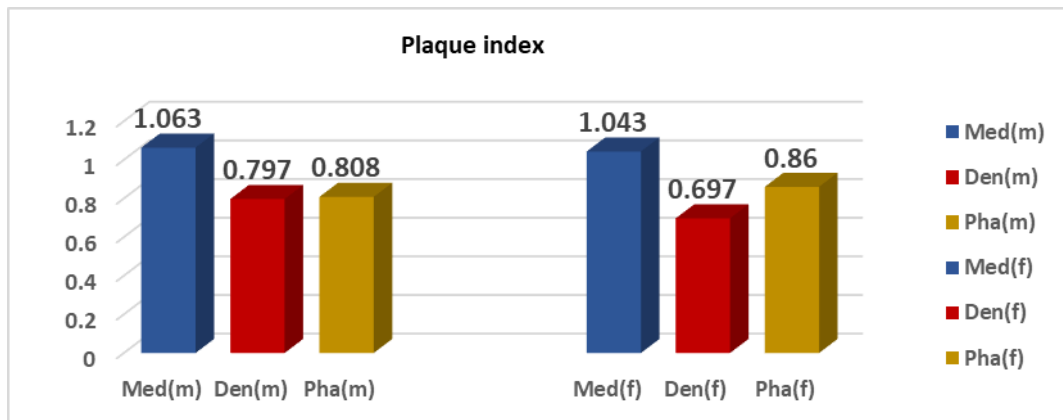


Figure 3-1: The mean values of Plaque index in male and female medical, dental, and pharmacy student groups. (m): male, (f): female

The Gingival Index (GI) is higher among dental students, especially females (0.673), than among males (0.457). However, there are no significant differences. The middle groups are pharmacy students, males (0.36) and females (0.178). The lowest one is the medical students. However, all group differences are non-significant (P > 0.05), as shown in Table 3-2 and Figure 3-2.

Table (3-2): Levels of the Gingival Index in medical, dental, and pharmacy groups according to gender

Groups	Gingival index			P-value ≤ 0.05 P (m & f)
	Total	(Mean ± SD) Female	Male	
Med No. (25)	0.167 ± 0.223	0.110 ± 0.139	0.230 ± 0.281	0.203
Den No. (25)	0.570 ± 0.674	0.673 ± 0.573	0.457 ± 0.780	0.442
Pha No. (25)	0.835 ± 0.433	0.178 ± 0.201	0.360 ± 0.400	0.176

P: T-test between female and male, SD: Standard Deviation
 (P ≤ 0.05): Significant; (P > 0.05): Non-significant

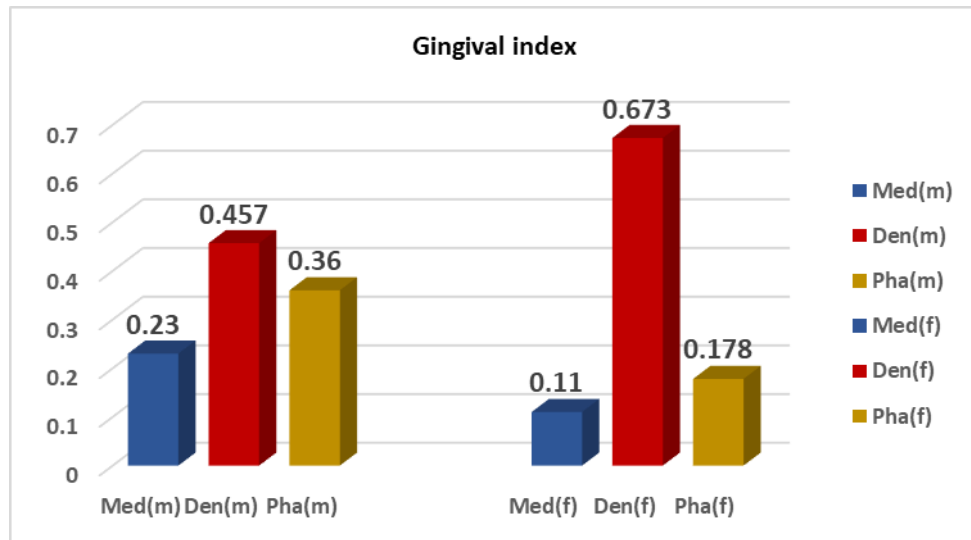


Figure 3-2: The mean values of the Gingival index in males and females of medical, dental and pharmacy groups.

Bleeding on probing (BOP) is common among dental students, especially among females (0.769). This is followed by male pharmacy students (0.5). Then males of dental students (0.416) and females of medical students (0.307). The mean of female pharmacy students is 0.23, and the lowest score is that of male medical students (0.166). However, all groups are non-significant, $P > 0.05$. Table (3-3) and figure (3-3).

Table (3-3): Levels of bleeding on probing in medical, dental, and pharmacy groups according to gender

Groups	Bleeding on probing			P-value ≤ 0.05 P (m & f)
	Total	(Mean \pm SD) Female	Male	
Med No. (25)	0.24 \pm 0.435	0.307 \pm 0.480	0.166 \pm 0.389	0.426
Den No. (25)	0.6 \pm 0.5	0.769 \pm 0.438	0.416 \pm 0.514	0.08
Pha No. (25)	0.36 \pm 0.489	0.230 \pm 0.438	0.5 \pm 0.522	0.178

P: T-test between female and male, SD: Standard Deviation
($P \leq 0.05$): Significant; ($P > 0.05$): Non-significant

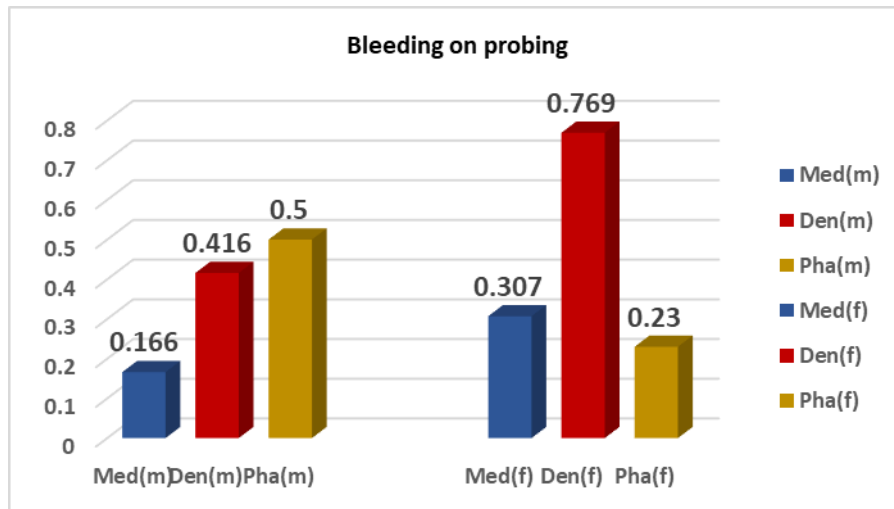


Figure 3-3: The mean values of bleeding on probing in males and females of medical, dental, and pharmacy groups.

Probing pocket depth (POD): in general, both male and female pockets, but there is a small percentage of male dental students. However, both groups are non-significant. Among pharmacy students, pockets are common, especially among males (0.054) and females (0.025). This group is significantly higher than other groups, $P \leq 0.05$. Table (3-4) and figure (3-4).

Table (3-4): Levels of probing pocket depth on probing in medical, dental, and pharmacy groups according to gender

Groups	Probing pocket depth			P-value (≤ 0.05) P (m & f)
	Total	(Mean \pm SD) Female	Male	
Med No. (25)	00 \pm 00	00 \pm 00	00 \pm 00	0.0
Den No. (25)	0.013 \pm 0.045	00 \pm 00	0.027 \pm 0.064	0.166
Pha No. (25)	0.039 \pm 0.085	0.025 \pm 0.061	0.054 \pm 0.107	0.413

P: T-test between Female and Male, SD: Standard Deviation

($P \leq 0.05$): Significant; ($P > 0.05$): Non-significant

Med: medical students, Den: dental students, Pha: pharmacological students.

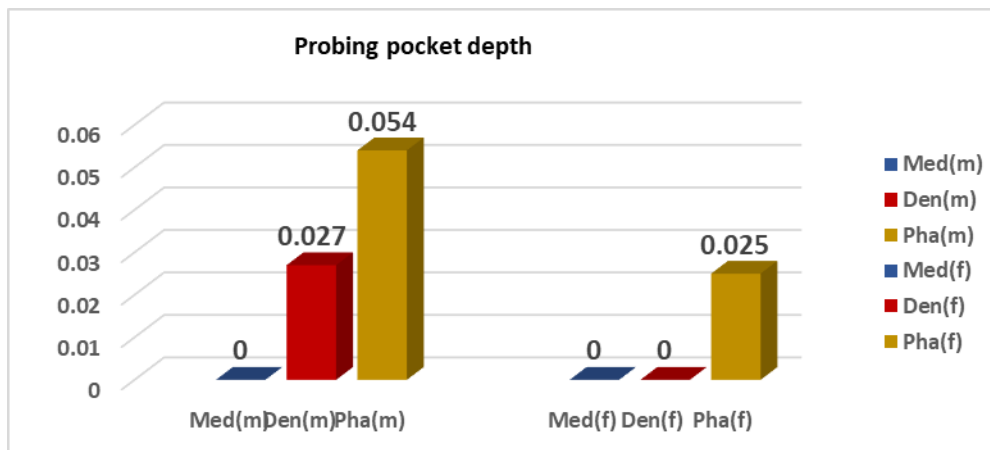


Figure 3-4: The mean values of probing pocket depth in male and female medical, dental, and pharmacy student groups.

Clinical attachment loss (CAL) shows a highly significant difference between male dental students and female pharmacy students ($p < 0.05$). Mild significance in male pharmacy students, $P \leq 0.05$. However, the other three groups of medical students (females and males) and dental students (females) show no clinical attachment loss ($P > 0.05$). Table (3-5) and figure (3-5).

Table (3-5): Levels of Clinical attachment loss in medical, dental and pharmacy groups according to gender

Groups	Clinical attachment loss			P-value (≤ 0.05) P (m & f)
	Total	(Mean \pm SD) Female	Male	
Med No. (25)	0.0 \pm 0.0	0.0 \pm 0.0	0.0 \pm 0.0	0.0
Den No. (25)	0.003 \pm 0.011	0.0 \pm 0.0	0.006 \pm 0.016	0.166
Pha No. (25)	0.039 \pm 0.165	0.006 \pm 0.015	0.076 \pm 0.237	0.332

P: T-test between Female and Male, SD: Standard Deviation

($P \leq 0.05$): Significant; ($P > 0.05$): Non-significant

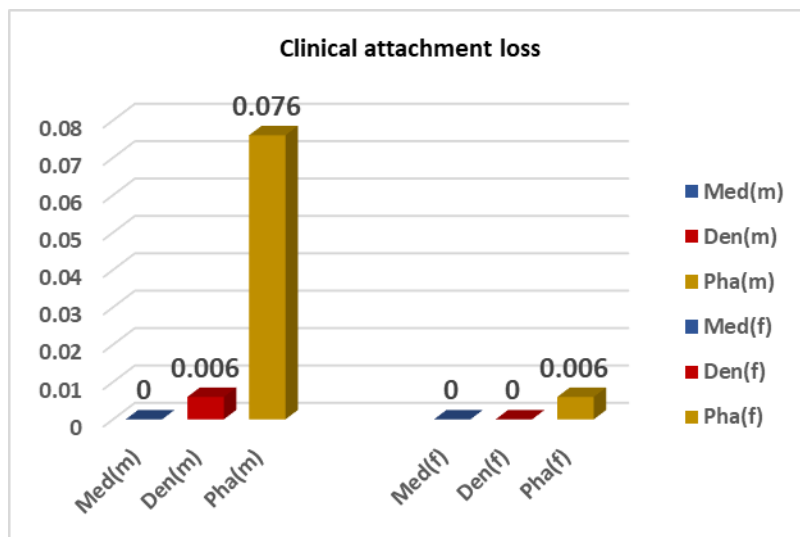


Figure (3-5): The mean values of Clinical attachment loss in males and female of medical, dental and pharmacy groups.

4. Discussion

PI showed a highly significant accumulation in male medical students (1.063) but not in female medical students (1.043). Moderate to mild in pharmacological students about females (0.86) and males (0.808). Simple plaque accumulation in dental students was (0.697) in females and (0.797) in males. The greater plaque accumulation surfaces are the proximal surfaces compared to the buccal and lingual surfaces. There is less plaque accumulation in the lower teeth than in the posterior teeth and the upper anterior teeth. PI was not significantly different between males and females in all groups. These results were in line with the study by Braz, São Paulo (2014), which showed agreement with the PI results; there were no significant differences across all groups ($P > 0.05$). Most of the participants have mild to moderate signs of gingivitis, with the highest level among female dental students (0.673). Then, males (0.457) have the lowest percentage in both medical and pharmacological students; males of pharmacological students (0.36) > males of medical students (0.23) > females of pharmacological students (0.178) > males of medical students (0.11). Not all groups have a significant percentage, $P > 0.05$. These results agree with the study of [Rodan et al. (2015)]. Only 29.8 % had healthy gingiva, 38.5 % had mild gingivitis, 31.4 % had moderate gingivitis, and 0.3 % had severe gingivitis. The difference between the two genders was not statistically significant ($P > 0.05$). (BOP) shows high percentage bleeding on probing in females of dental students (0.769) for buccal and proximal surface in class II amalgam restoration especially followed by male of pharmacological students (0.5) then males of dental students (0.416) after that the females of medical students (0.307) than females of pharmacological students (0.23) and the last one is males of medical students (0.166), all group had non-significant percentage $P > 0.05$. These results align with a

study that showed participants in (Braz Oral Res., (São Paulo, 2014) had high BOP rates. The total BOP score for participants was 37% (22). BOP scores for the proximal and buccal surfaces were 42% (23) and 25% (23), respectively. BOP scores of less than 20% were observed in 26% (91/355) of participants, whereas 24% (86/355) had BOP scores of at least 50%. The BOP scores did not differ significantly between male (38%) and female (34%) participants. Braz Oral Res., (São Paulo, 2014). PPD revealed that half of the groups had no sites of increased PD, with a range of 2-3 mm, which is within the normal range of PD, and the other half had periodontal pockets of at least 4mm. These give mild, significant differences between females and males. These results differ from those of the study by Braz Oral Res., São Paulo, 2014. Where the level of PD is greater than 4mm, and reaches 6 mm in 4% of participants. (CAL) demonstrates highly significant differences in females of pharmacological students and males of dental students; the percentage of the two groups of males of dental students and females of pharmacological students is (0.006), while mild significant differences in males of pharmacological students (0.076). However, non-significant differences were observed among males, female medical students, and female dental students ($p > 0.05$). These results differ from those of the Braz Oral Res (2014) study, as the percentage of clinical attachment loss in this study ranged from mild to moderate periodontitis. While in this study, the percentage range from healthy attachment gingiva to mild. These differences could be due to differences in the race and culture of the samples and the sample size. The limitations of the study include limited time to gather information, resulting in small sample sizes, and some students are not cooperative because they are busy or shy. We recommended a large sample size to achieve more precise results. Examinations would be performed at a dental chair to obtain a more accurate reading.

5. Conclusions

PI was high; however, it is not the main problem. GI and BOP in dental students, especially in females, were high, and increased in PD in male and female pharmacy students, leading to a loss of 1mm of clinical attachment level in a few students. Students should be advised to maintain excellent oral hygiene. This would ring the bell, and instruction programs should be set up on brushing technique, the appropriate type of toothpaste or mouthwash, and the dangers of smoking on oral health, especially on periodontal tissue.

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No Supplementary Materials.

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Author 1: methodology, writing—original draft preparation; methodology (sample collections and measurements); and Author 2: writing—review and editing. All authors have read and agreed to the published version of the manuscript.

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