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KNOWLEDGE & ATTITUDE OF GENERAL DENTIST, REGARDING PERIODONTAL DISEASE DIAGNOSIS, TREATMENT PROTOCOL AND PERIODONTAL SPECIALIST REFERRAL

Mahirah Iqbal[1], Hussam Muhammad Ashfaq[2], Muhammad Ifham Khan Jadoon[3], Muhammad Jamil[2], Azeem Khan[1], Abira Hamid[1]

[1]Department of Periodontology, Peshawar Dental College, Peshawar
[2]Department of Periodontology, Khyber College of Dentistry, Peshawar
[3]Department of Periodontology, Dental Section Ayub Medical College, Abbottabad

ABSTRACT

Objectives: *To assess the knowledge, attitudes, and practices of general dentists regarding periodontal disease diagnosis, treatment strategies, and referrals to specialists.*

Materials and Methods: *A cross-sectional survey was conducted among 185 dentists in Peshawar, utilizing a pre-customized, closed-ended questionnaire through convenience sampling technique. The survey included practitioners from dental government and private teaching hospitals as well as independent clinics, encompassing both genders and any age. Informed consent was incorporated into the questionnaire. Exclusion criteria were undergraduate students, house surgeons, and periodontists. Data were collected using the questionnaire based on participants' understanding of periodontal diseases, diagnostic frequency, referral practices, and treatment approaches.*

Results: *Most dentists favored scaling as the primary treatment for bleeding on probing (n=149, 80.54%) and identified loss of attachment as the cause of tooth mobility (n=158, 85.41%). The study revealed a significant association between years of experience and various aspects of periodontal care, including referral practices (p=0.047), diagnostic accuracy (p=0.018), and treatment strategies (p=0.05). Despite a recognized link between poor oral hygiene and periodontal diseases, the referral rate to periodontists was notably low (10.27%).*

Conclusion: *General dentists exhibit deficiencies in knowledge concerning the causes, referral processes, and the importance of specialized care in periodontology.*

Key words: *Periodontal disease, General dentists, Referral practices, Treatment protocols, Dental education*

INTRODUCTION

The periodontium serves as the attachment apparatus for dentition. A robust and healthy periodontium contributes to the prolonged maintenance of dentition throughout an individual's life[1]. Comprising the gingiva, periodontal ligament, cementum, and alveolar bone, the periodontium ensures the stable anchorage of teeth, allowing for effective mastication and overall oral health[2].

Common disorders affecting the periodontium include gingivitis and periodontitis. Gingivitis, characterized by inflammation of the gingiva, is typically a reversible condition[3]. It manifests as redness, swelling, and bleeding of the gingiva, often caused by plaque accumulation[4]. With proper oral hygiene and professional dental care, gingivitis can be effectively managed and reversed, restoring the health of the gingiva[5]. In contrast, periodontitis is a more severe condition that involves the irreversible loss of attachment and supporting structures of the

Correspondence:
Hussam Muhammad Ashfaq
Chairperson and Assistant Professor,
Department of Periodontology, Khyber College of Dentistry, Peshawar
Email: hussam@kcd.edu.pk

teeth[6]. It progresses from untreated gingivitis and leads to the destruction of the periodontal ligament and alveolar bone[7]. This irreversible damage can result in tooth mobility and eventual tooth loss if not managed promptly. Periodontitis requires more intensive treatment, including deep cleaning, and in severe cases, surgical interventions to halt its progression and manage its effects[8].

Dentists have a pivotal responsibility in preservation of dentition by implementing preventive measures and comprehensive treatments[9,10]. Periodontology is undergoing notable progress, spanning advancements in diagnosis, treatment strategies, regenerative techniques, and the integration of growth factors for diverse periodontal diseases[11]. This progress has significantly enhanced the reliability of predicting success in periodontal treatment plans based on evidence-based practices[12]. Despite the commendable education provided by various dental institutions to both undergraduate and postgraduate students in the field of periodontology, there exists a limitation in the depth of specialized education offered at the undergraduate level[13]. This gap may impact the proficiency of general practitioners who are not specialized in periodontology[14]. Patients seeking periodontal care from specialists in private practices or dental institutions benefit from high-quality treatment. However, a considerable number of patients consulting general practitioners may not receive the necessary level of care due to the complexity of periodontal issues and the specific expertise required[15].

A previous survey conducted in India reported that 63% of dentists did not refer patients to specialists. Among general practitioners (GPs), 38% consulted periodontists for periodontal pockets, while 32% did so for bleeding gums and gingival recession each. The main procedures performed by periodontists, for which the cases were referred, were flap surgeries (37%), bone grafting (27%), and crown lengthening (25%)[16].

Challenges like limited access to care, socioeconomic factors, patient anxiety, and a reluctance to accept referrals pose obstacles to proper treatment. Periodontal diseases, a group of inflammatory conditions affecting the tissues supporting the teeth, can lead to tooth loss if untreated, with significant implications for both oral and systemic health. General dentists, as the primary providers of oral healthcare, play a crucial role in the early diagnosis and management of these diseases, identifying early signs like bleeding on probing, loss of attachment, and tooth mobility. Early intervention is key in preventing disease progression and reducing the need for invasive treatments later. Despite the critical role of timely referrals to periodontists for complex cases, many general dentists underutilize these referrals due to factors such as lack of awareness, confidence in their own treatment capabilities, or perceived patient barriers like cost or access. This underscores the importance of educating general dentists about proper diagnostic techniques, treatment protocols, and the value of specialist referrals. By addressing gaps in knowledge and enhancing collaboration with periodontists, patient outcomes can be significantly improved.

The study aimed to assess the knowledge of general dentists regarding the diagnosis, treatment strategies, and their opinions on periodontal treatment procedures and referrals to specialists.

MATERIALS AND METHODS

A cross-sectional survey was conducted through a pre-customized, close-ended questionnaire from approximately 200 dentists practicing at different dental institutes in Peshawar and finally 185 were included in the analysis. The survey utilized a convenience sampling technique from January 2023 to September 2023. No ethical approval was needed from the hospital, as this study does not involve patients and the resources of the hospital. The sample size was calculated to be 185 with a 5% margin of error and a 95% confidence interval, using a 38% frequency of periodontist consultation for periodontal pocket from a previous study16. Practitioners working in dental teaching hospitals (public/private sectors) or running an independent clinic (institutional-based practice/private), of both genders and age groups, were included in this survey. Informed consent, along with an explanation of the study's aims and objectives, was a part of the questionnaire. Undergraduate students, those working in house jobs, and periodontists were excluded. Participants were approached personally during their free clinical time, and some were contacted through emails. Those who were invited by emails and did not respond received a reminder after one week.

This questionnaire aimed to assess the knowledge and attitudes of general dentists regarding the diagnosis, treatment protocols, and referral practices for periodontal disease. Dentists were queried about their years of practice, their understanding of periodontal disease, and the frequency with which they assessed patients showing signs of gingival or periodontal disease. The survey explored whether dentists referred patients to periodontists and, if so, for which specific signs and symptoms. For those not referring, the questionnaire delved into the signs they checked for during periodontal assessments. Treatment approaches for various conditions, such as bleeding gums and pockets of 5-8 mm, were also investigated. Dentists were asked about their involvement in surgical periodontal treatments and their approach to the mobility of teeth, furcation involvement, and mucogingival defects. The questionnaire concluded with inquiries about the dentists' practices regarding patient follow up for maintenance therapy and their perspectives on factors contributing to the recurrence of periodontal disease after treatment. The questionnaire was piloted on 15 participants, and its reliability was assessed using Cronbach's alpha, yielding a value of 0.91, indicating high internal consistency.

The data analysis was conducted using SPSS version 22. Mean and standard deviation (SD) were computed for age, while frequencies with percentages were calculated for all qualitative variables. The comparison of awareness regarding periodontal disease diagnosis, treatment protocol, and periodontal specialist referral among general practitioners with different levels of experience was performed using the chi-square or Fisher exact test. A significance level of $P \leq 0.05$ was set for determining statistical significance.

RESULT

The mean age of the participants was 40.55±6.32 years. Regarding gender distribution, 102(55.14%) were female and 83(44.86%) were male. The majority of participants, constituting 74.05% (n=137), held a Bachelor of Dental Surgery (BDS) degree. A smaller proportion, 11.89% (n=22), had pursued postgraduate studies. The category of specialists comprised 14.05% (n=26) of the participants. (Fig 1).

Table 1 provides statistics on dental practitioners' approaches to periodontal diseases. A significant (n=147, 79.46%) of respondents link periodontal disease to poor oral hygiene, while 19(10.27%) make referrals in such cases. In terms of patient assessment frequency, 110 (59.46%) assess patients twice a week, 40(21.62%) assess daily, 28 (15.14%) assess once a week, and only 7(3.78%) assess once a month. Surprisingly, despite frequent assessments, a substantial (n=166 , 89.73%) do not refer patients

Table 1: Basic awareness about regarding periodontal disease diagnosis, treatment protocol & periodontal specialist referral among dentists

Questions	Characteristic	n(%)
What in your knowledge, is Periodontal Disease?	Genetic	5 (2.70)
	Multi-factorial	16 (8.65)
	Poor OH	147 (79.46)
	Systemic disease	17 (9.19)
How frequently do you assess a patient who show signs of gingival or periodontal disease?	Every day	40 (21.62)
	Once a month	7 (3.78)
	Once a week	28 (15.14)
	Twice a week	110 (59.46)
Do you refer your patients to a periodontist, who show signs of gingival or periodontal diseases?	No	166 (89.73)
	Yes	19 (10.27)
For which signs and symptoms of the patients do you consult a periodontist?	Furcation involvement	2 (1.08)
	Gingival enlargement	4 (2.16)
	Gingival recession	8 (4.32)
	Mobility	4 (2.16)
	Nil	166 (89.73)
	Presence of periodontal pockets	1 (0.54)
What is your line of treatment for patients with bleeding gums?	Scaling	149 (80.54)
	Scaling & OHI	29 (15.68)
	Scaling and root planning	7 (3.78)

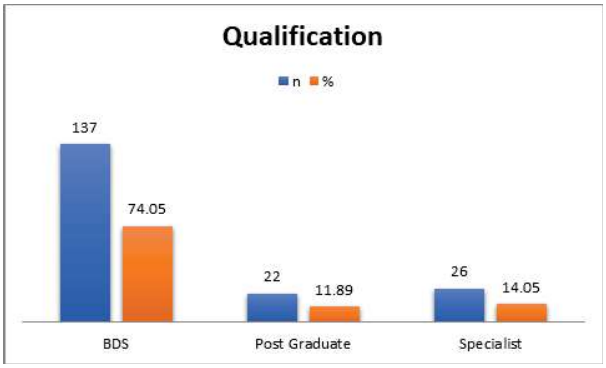

Fig 1: Qualification of the participants

to periodontists. For those who do make referrals, specific signs prompting action include gingival recession (n=4, 2.16%) and mobility 4 (2.16%). The primary treatment for bleeding gums is scaling (n=149, 80.54%), with 15.68% combining it with oral hygiene instruction.

Table 2 reveals significant insights into the practices of dental practitioners when it comes to addressing periodontal diseases. Regarding the management of bleeding gums, the majority (80.54%, n=149) opt for scaling, while 15.68% (n=29) choose a combination of scaling and oral hygiene instruction (OHI), and 3.78% (n=7) prefer scaling and root planning. In cases with pocket depths ranging from 5-8 mm, a unanimous 100% (n=185) favor a comprehensive approach involving scaling, root planning, and antibiotics. Referral practices for surgical periodontal treatment indicate that a considerable 76.76% (n=142) of practitioners choose to refer patients, while 23.24% (n=43) do not. Additionally, the majority (94.59%, n=175) do not perform surgical periodontal treatments in-house, with only 5.41% (n=10) reporting otherwise. Causes of tooth mobility are identified as loss of attachment (85.41%, n=158), trauma from occlusion (7.57%, n=14), and iatrogenic factors (7.03%, n=13). The primary treatment for tooth mobility is extraction for the majority (76.76%, n=142), followed by scaling, root planning, and observation (15.14%, n=28), and splinting (8.11%, n=15). In assessing furcation involvement, 14.05% (n=26) use probing, 33.51% (n=62) use radiographs, and 52.43% (n=97) are uncertain. Treatment for furcation involvement includes extraction (56.76%, n=105), no intervention (21.08%, n=39), and root canal treatment (22.16%, n=41). Furthermore, the majority (78.38%, n=145) do not routinely check for mucogingival defects, while 21.62% (n=40) do. As for patient recall for maintenance therapy after periodontal treatment, a significant 76.22% (n=141) do not routinely recall patients, while 23.78% (n=44) do. Lastly, factors contributing to the recurrence of periodontal disease after treatment are attributed to patient factors (86.49%, n=160), with a smaller percentage identifying operator factors (13.51%, n=25).

Table 3 shows dental practitioners' awareness, practices, and referral patterns for periodontal diseases, categorized by experience. While understanding the disease showed no significant differences (p=0.19), poor oral hygiene was universally recognized. Significant variations emerged: practitioners with 5-10 years assessed patients twice a week more frequently (p=0.05), and those with <5 years were more likely to refer patients to a periodontist (p=0.047). Notably, those with 5-10 years were

Table 2: Advances awareness about regarding periodontal disease diagnosis, treatment protocol & periodontal specialist referral

Questions	Characteristic	n(%)
What is your line of treatment for patients with bleeding gums?	Scaling	149 (80.54)
	Scaling & OHI	29 (15.68)
	Scaling and root planning	7 (3.78)
What is your line of treatment for pocket of 5-8 mm?	Scaling, Root Planning and antibiotics	185 (100.00)
Do you refer your patients to a periodontist, for surgical periodontal treatment	No	43 (23.24)
	Yes	142 (76.76)
Do you carry on periodontal treatment at your clinic by yourself	No	175 (94.59)
	Yes	10 (5.41)
Causes of tooth mobility	Iatrogenic	13 (7.03)
	Loss of attachment	158 (85.41)
	Trauma from occlusion	14 (7.57)
Line of treatment for tooth mobility	Extraction	142 (76.76)
	Scaling, Root planning and observe	28 (15.14)
	Splinting	15 (8.11)
How you check furcation involvement	Don't know	97 (52.43)
	Probing	26 (14.05)
	Radiograph	62 (33.51)
Line of treatment for furcation involvement	Extraction	105 (56.76)
	No intervention	39 (21.08)
	RCT	41 (22.16)
How you check mucogingival defects	No	145 (78.38)
	Yes	40 (21.62)
Do you recall your patients for maintenance therapy after the periodontal treatment	No	141 (76.22)
	Yes	44 (23.78)
What do you think are the factors responsible for the recurrence of the periodontal disease after the treatment?	Operator factors	25 (13.51)
	patients factors	160 (86.49)

more inclined to refer for furcation involvement (p=0.018). Treatment trends for bleeding gums showed a non-significant trend (p=0.057), with <5 years favoring scaling alone.

Table 4 presents analysis of advanced awareness, practices, and referral tendencies among dental practitioners concerning periodontal diseases, stratified by experience. Notably, the willingness to refer patients for surgical periodontal treatment exhibited no statistically significant differences across experience levels (p=0.89). Similarly, the surgical periodontal treatments conducted in clinics showed no significant differences (p=0.56), with a trend indicating that a small proportion of practitioners, especially those with 5-10 years of experience, carried out such treatments. Concerning the causes of tooth mobility, a significant difference was observed (p=0.033), highlighting that practitioners with 5-10 years of experience identified iatrogenic factors more frequently than their counterparts. However, the line of treatment for tooth mobility did not reach statistical significance (p=0.18), although there was a trend indicating that practitioners with less than 5 years of experience were more likely to opt for extraction. The approach to checking furcation involvement revealed a significant difference (p=0.013), indicating that practitioners with 5-10 years of experience were more likely to use probing compared to other experience groups. However, the subsequent line of treatment for furcation involvement did not exhibit statistical significance (p=0.21). Assessment of mucogingival defects and patient recall for maintenance therapy after periodontal treatment showed no statistically significant differences across experience levels (p=0.39 and p=0.61, respectively).

DISCUSSION

The survey targeted general dentists, categorizing them into three experience groups. These dentists regularly interact with diverse patients. The closed, personal questionnaire aimed to gather specific insights. A realistic analysis was conducted to understand dentists' experiences, challenges, and

Table 3: Basic awareness about regarding periodontal disease diagnosis, treatment protocol & periodontal specialist referral by level of experience

Variable	Characteristic	5-10yr, N = 35	above 10yrs, N = 18	less 5 yr, N = 132	p-value
What in your knowledge, is Periodontal Disease?	Genetic	1 (2.86)	0 (0.00)	4 (3.03)	0.19**
	Mulitfactorial	4 (11.43)	4 (22.22)	8 (6.06)	
	Poor OH	25 (71.43)	14 (77.78)	108 (81.82)	
	Systemic disease	5 (14.29)	0 (0.00)	12 (9.09)	
How frequently do you assess a patient who show signs of gingival or periodontal disease?	Every day	10 (28.57)	3 (16.67)	27 (20.45)	0.05**
	Once a month	3 (8.57)	0 (0.00)	4 (3.03)	
	Once a week	2 (5.71)	0 (0.00)	26 (19.70)	
	Twice a week	20 (57.14)	15 (83.33)	75 (56.82)	
Do you refer your patients to a periodontist, who show signs of gingival or periodontal diseases?	No	28 (80.00)	15 (83.33)	123 (93.18)	0.047*
	Yes	7 (20.00)	3 (16.67)	9 (6.82)	
For which signs and symptoms of the patients do you consult a periodontist?	Furcation involvement	0 (0.00)	1 (5.56)	1 (0.76)	0.018**
	Gingival enlargement	2 (5.71)	2 (11.11)	0 (0.00)	
	Gingival recession	3 (8.57)	0 (0.00)	5 (3.79)	
	Mobility	2 (5.71)	0 (0.00)	2 (1.52)	
	Nil	28 (80.00)	15 (83.33)	123 (93.18)	
	Periodontal pockets	0 (0.00)	0 (0.00)	1 (0.76)	
What is your line of treatment for patients with bleeding gums?	Scaling	25 (71.43)	12 (66.67)	112 (84.85)	0.057**
	Scaling & OHI	7 (20.00)	6 (33.33)	16 (12.12)	
	Scaling and root planning	3 (8.57)	0 (0.00)	4 (3.03)	

*Chi-square test, **Fisher exact test, p<0.05 was significant level

practices across different experience levels.

Notably, a significant majority of respondents (79.46%) attribute these diseases to poor oral hygiene. This emphasizes the widely recognized connection between oral hygiene practices and periodontal health. Literature has established that poor oral hygiene results in periodontal diseases[17].

Our findings showed that referral rate was very lower in our dentists(10.27%). The low referral rate despite this clear association suggests that a considerable proportion of dental practitioners may prefer to manage periodontal cases themselves rather than referring to specialists. Similar results were reported in previous study[18].

When participants were asked about their preferred treatment for patients with bleeding gums, the majority (80%) indicated that scaling alone is the most effective treatment. Some respondents suggested that a combination of scaling and oral hygiene instructions is necessary for treating gingivitis. Additionally, a few dentists recommended incorporating root planning along with scaling to control gum bleeding. These findings suggest that our population of general dental practitioners possesses adequate knowledge regarding the treatment of gingivitis. Previous studies reported dental and dentists have adequate knowledge about gingivitis[18,19].

Our research outcomes underscore the noteworthy impact of varying levels of clinical experience on several critical aspects within the realm of periodontal care. Specifically, our investigation revealed a substantial correlation between the practitioner's level of experience and the efficacy of the referral process. It became evident that the depth of clinical expertise plays a pivotal role in influencing the accuracy and timeliness of referrals for periodontal issues. Furthermore, our study illuminated the profound

Table 4: Advanced awareness about regarding periodontal disease diagnosis, treatment protocol & periodontal specialist referral by level of experience

Variable	Characteristic	5-10yr, N = 35	above 10yrs, N = 18	less 5 yr, N = 132	p-value
Do you refer your patients to a periodontist, for surgical periodontal treatment	No	8 (22.86)	5 (27.78)	30 (22.73)	0.89*
	Yes	27 (77.14)	13 (72.22)	102 (77.27)	
Do you carry on periodontal treatment at your clinic by yourself?	No	33 (94.29)	18 (100)	124 (93.94)	0.56**
	Yes	2 (5.71)	0 (0.00)	8 (6.06)	
Causes of tooth mobility	Iatrogenic	1 (2.86)	0 (0.00)	12 (9.09)	0.033**
	Loss of attachment	30 (85.71)	14 (77.78)	114 (86.36)	
	Trauma from occlusion	4 (11.43)	4 (22.22)	6 (4.55)	
Line of treatment for tooth mobility	Extraction	25 (71.43)	15 (83.33)	102 (77.27)	0.18**
	Scaling, Planning and observe	8 (22.86)	0 (0.00)	20 (15.15)	
	Splinting	2 (5.71)	3 (16.67)	10 (7.58)	
How you check furcation involvement	don't know	27 (77.14)	7 (38.89)	63 (47.73)	0.013*
	Probing	4 (11.43)	4 (22.22)	18 (13.64)	
	Radiograph	4 (11.43)	7 (38.89)	51 (38.64)	
Line of treatment for furcation involvement	Extraction	22 (62.86)	6 (33.33)	77 (58.33)	0.21*
	no intervention	5 (14.29)	7 (38.89)	27 (20.45)	
	RCT	8 (22.86)	5 (27.78)	28 (21.21)	
How you check mucogingival defects	No	29 (82.86)	12 (66.67)	104 (78.79)	0.39*
	Yes	6 (17.14)	6 (33.33)	28 (21.21)	
Do you recall your patients for maintenance therapy after the periodontal treatment	No	27 (77.14)	12 (66.67)	102 (77.27)	0.61*
	Yes	8 (22.86)	6 (33.33)	30 (22.73)	

*Chi-square test, **Fisher exact test

implications of experience on the diagnostic phase of periodontal disease. Practitioners with a higher level of experience demonstrated a more nuanced understanding of discerning periodontal disease based on both observable signs and reported symptoms. This heightened diagnostic acumen among seasoned professionals suggests that years of clinical exposure contribute significantly to the ability to accurately identify and categorize periodontal conditions. Additionally, our findings extended to the management of periodontal diseases, where the influence of experience emerged as a key factor. Experienced practitioners exhibited a more comprehensive and nuanced approach to the management of periodontal conditions. Previous studies also reported that level of experience impact management and referral of periodontal patients to specialist care[18,20]. A study assessed the impact of experience on the management and referral of periodontal patients to specialists among dental and dental hygiene students. Despite 90% of dental and 96% of dental hygiene students expressing willingness to refer patients with active periodontal disease to specialists, only 40% of dental and 36% of dental hygiene students felt confident in diagnosing, managing, and referring these patients[21].

This study is constrained by several limitations, including a relatively small participant pool, the utilization of closed-ended questions, reliance on convenience sampling methodology, and a narrow focus limited to dentists in a single city.

CONCLUSION

The study findings lead to the conclusion that our dentists lack sufficient knowledge regarding the causes, referral processes, and the pivotal importance of specialized care in the field of periodontology.

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