Factors Affecting Patient Referral to Periodontists from General Dental Practitioners in the City of Manila: A Descriptive Cross-sectional Study

Khimberly Joyce A. Flores, DDM,[1] Ma. Celina U. Garcia, DDM[2] and Kristine Rachelle R. Pacete-Estrera, DDM[3]

[1]College of Dentistry, University of the Philippines Manila
[2]Department of Clinical Dental Health Sciences, College of Dentistry, University of the Philippines Manila
[3]Department of Community Dentistry, College of Dentistry, University of the Philippines Manila

ABSTRACT

Background and Objective. The primary determinant for patient referral by general dental practitioners (GDPs) to periodontists differs based on the country of practice. Moreover, previous research has revealed that GDP preferences for managing periodontal patients, actual number of referrals, and the overall decision-making process have evolved over time. Understanding the periodontal referral pattern of Filipino GDPs could help identify factors that promote or inhibit referral to periodontists. These factors may in turn be used as basis for the formulation of periodontal referral guidelines for use by GDPs in the Philippines. Therefore, this study aimed to determine the factors that affect the referral patterns of Filipino GDPs to periodontists, with GDPs practicing in the City of Manila as the representative population.

Methods. A descriptive cross-sectional study design with the use of a self-administered survey was utilized for this study. Participants were 75 licensed dentists practicing in the City of Manila who were members of the Philippine Dental Association-Manila Dental Chapter. The questionnaire collected information on sociodemographic characteristics of the participants, periodontal referral pattern, and the factors considered by the participants when referring patients to a periodontist. Descriptive statistics (frequency and percentage) were used to report the study's findings.

Results. Majority (92%) indicated that they regularly referred patients with periodontal disease to periodontists, with a personal estimate of up to 20 periodontal case referrals monthly by 81.3% of the participants and >20 referrals for 10.7%. The clinical factors considered as most important when referring to a periodontist were the type of periodontal disease (81.3%), periodontitis severity (74.7%), and the presence of a complex medical history (61.3%). Among the non-clinical factors, the most influential were the following: uncooperative patient (32%), perceived personal skill (24%), postgraduate training of the periodontist (21.3%), and the patient's financial capacity (13.3%).

Conclusion. Multiple factors affect the decision of general dental practitioners in the City of Manila when referring patients to a periodontist. Majority are influenced by clinical factors such as the type and severity of periodontal disease and the systemic condition of the patient. Although considered to a much lesser degree compared to clinical factors, the top non-clinical factors that Manila GDPs base their referral decisions include the assessment that a patient is uncooperative and the perceived adequacy of personal skills in managing periodontal patients.

Keywords: periodontal diseases, referral and consultation, dentists, periodontists

Corresponding author: Ma. Celina U. Garcia, DDM
Department of Clinical Dental Health Sciences
College of Dentistry
University of the Philippines Manila
Pedro Gil St., corner Taft Avenue,
Ermita, Manila 1000, Philippines
Email: mugarcia2@up.edu.ph
ORCiD: https://orcid.org/0000-0003-0654-356X

INTRODUCTION

Periodontal disease is one of the most prevalent diseases in the oral cavity. Also known as gum disease, it is a chronic inflammatory condition that affects the structures that support the teeth and develops when the dental biofilm matures and is left undisrupted.[1,2] In the Philippines, the prevalence of periodontal disease among 4419 participants aged 5-74 years was 49.9%, based on the 2018 National Survey on Oral Health. This percentage included both cases of gingivitis and periodontitis.[3] Moreover, periodontitis, which is the more severe type of periodontal disease, afflicts approximately 50% of adults and over 60% of over 65-year-olds worldwide, with severe periodontitis affecting about 10–15% of populations.[4]

According to the Policies, Standards and Guidelines for the Doctor of Dental Medicine (DDM) Program by the Commission on Higher Education, dental medicine students are required to take two Periodontics courses that will teach them the principles and concepts in the prevention, recognition, differential diagnosis, and management of periodontal diseases.[5] Therefore, the DDM curriculum in the Philippines tries to ensure that there is sufficient periodontal training which prepares general dental practitioners in the management of patients with gingivitis and periodontitis, without having to refer to a periodontist. However, despite the capability of general practitioners to cater to the needs of most patients with periodontal diseases, sometimes, there will still be a need for periodontists to treat difficult and advanced cases of periodontitis, patients with systemic comorbidities, and complex cases that require expertise that can only be acquired through specialist training.[6]

The referral system is a two-way street between the referring dentist, usually the general practitioner, and the specialist. Clinical guidelines for referral have been developed by some periodontology specialty groups such as the American Academy of Periodontology and the British Society of Periodontology.[7,8] However, the decision to refer is ultimately up to the general dentist, based on careful consideration of factors such as adequacy of training and understanding of the patient's condition.[9]

Several studies from different countries have explored the referral patterns by general dentists to periodontists. In a study by Sum et al., the most important disease-related factor considered when referring periodontal patients was unresolved inflammation upon re-evaluation.[10] On the other hand, in a study by Kraatz et al., referral to a specialist was associated with the extent of periodontal destruction, degree of tooth movement, potential difficulty in management due to patients' systemic conditions, or unfavorable outcome of previous therapy by the referring dentist.[11] Aside from clinical factors, there are also non-clinical factors that influence the referral decisions of GDPs. These include previous patient history of already having been treated by a periodontist and the general dentist's level of periodontal training.[10,12,13]

The main factor that influences periodontal referral varies among dentists from different countries[9-13] and referral patterns have been observed to change through the years[14]. Moreover, to the researchers' knowledge, the reasons for periodontal referral by Filipino GDPs to periodontists have not been previously investigated. Understanding the periodontal referral pattern of Filipino dentists could help identify factors that promote or inhibit referral to periodontists. These factors may in turn be used as basis for the formulation of periodontal referral guidelines for use by GDPs in the Philippines. Therefore, this study aimed to determine the factors that affect the referral patterns of Filipino general dental practitioners to periodontists, with GDPs practicing in the City of Manila as the representative population.

MATERIALS AND METHODS

Study Population and Data Collection

A descriptive cross-sectional study design with the use of a self-administered survey was utilized for this study.

Participants should have met the following inclusion criteria: (1) licensed dentist practicing in the City of Manila, (2) member of the Philippine Dental Association-Manila Dental Chapter (PDA-MDC), and (3) attended the PDA-MDC's 2nd Scientific Seminar for administrative year 2019-2020. Excluded were dentists who were members of the Philippine Society of Periodontology, which is the specialty organization in Periodontology that is recognized by the Philippine Dental Association and the Professional Regulation Commission of the Philippines. The sample size was computed using Microsoft® Excel® for Microsoft 365 MSO (Version 2409 Build 16.0.18025.20160). The confidence level and margin of error were set at 95% and 5%, respectively. Based on the 241 dentists who attended the PDA-MDC's 2nd Scientific seminar, the sample size was determined to be 149.

The self-administered questionnaire was developed by the authors based on studies on periodontal referral conducted by Lee et al., Sum et al., Ghiabi et al., and Linden.[9,10,12,15] The questionnaire was composed of seven items on socio-demographic characteristics of the participants and 17 items on the nature of dental practice, periodontal referral pattern, as well as the factors considered by the participants when referring patients to a periodontist. The questionnaire was pilot tested on 10 dentists who were not part of the sampling population. The final version was refined and finalized based on the results and feedback from the pilot testing.

The questionnaire and an informed consent form were placed in the seminar kit of the dentists who attended the PDA-MDC's 2nd Scientific Seminar. Potential participants were not required to provide any reason for refusal to take part in the study. Moreover, they could withdraw their participation at any time without consequence, as stated in the informed consent form. The questionnaires and consent forms were collected after the event when participants were about to exit the seminar area.

Statistical Analysis

Descriptive statistics (frequency and percentage) were used to report the sociodemographic characteristics of the participants, as well as the factors that influence patient referral to periodontists.

Ethics Approval

This study received technical and ethical approval from the University of the Philippines Manila Research Ethics Board (UPMREB 2018-553UND).

RESULTS

Response Rate

From a total of 241 licensed dentists who attended the PDA-MDC's Scientific Seminar, only 90 (37.3%) filled out and submitted their questionnaires. Out of the 90 collected responses, 15 were excluded from this study due to the following criteria: (1) informed consent forms not signed (n=12), and (2) members of the Philippine Society of Periodontology (n=3). The final number of respondents for this study was 75, for a response rate of 31.1% (Figure 1).

Sociodemographic Characteristics of the Participants

The sociodemographic characteristics of the 75 participants can be seen in Table 1. In terms of age, the highest percentage was obtained for dentists aged <35 years. Female respondents (62.7%) outnumbered males. More than half of the participants (58.7%) obtained a postgraduate degree or pursued continuing education studies. Enrollment in preceptorship programs was the most common type of continuing education (33.3%), followed by completion of short courses (22.7%). Only seven participants (9.3%) hold a master's degree, while two (2.7%) hold a doctorate degree. As to the number of years in practice, the highest percentage was that of dentists who have been rendering dental treatment
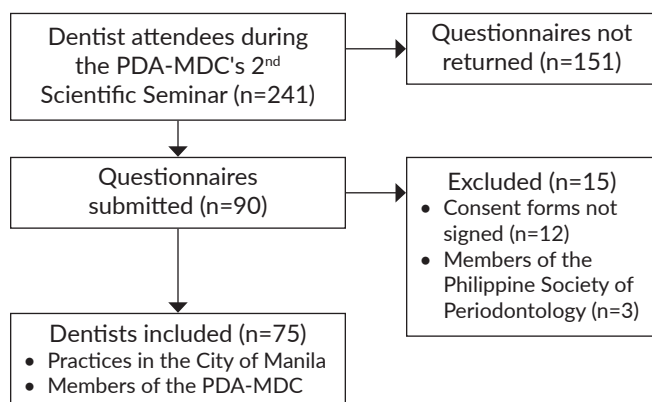
for <10 years. Lastly, of the participants who specified their monthly income, both the <30,000 PhP and 30,000-50,000 PhP income brackets obtained the highest frequency at 24% each.

Nature of the Periodontal Practices of the Participants

Majority of the participants treat patients with gingivitis (86.7%) and periodontitis (61.3%). Moreover, when asked to estimate the number of periodontal patients whom they see each month, most of the dentists (76%) reported managing less than 10 patients (Table 2).

A comprehensive list of periodontal treatment modalities and the prevalence of the participants who perform such procedures can be seen in Figure 2. When asked to specify the periodontal procedures that they perform, the top response was scaling and polishing, which 90.7% of the participants reported doing. On the other hand, the least performed procedures were guided tissue regeneration, bone grafting, and gingival grafting, which only 1.3% of the participants claimed to perform.

Figure 1. Flow diagram of participant screening for inclusion in the study.

PDA-MDC: Philippine Dental Association-Manila Dental Chapter

Table 1. Sociodemographic Characteristics of the Participants (N=75)

Sociodemographic characteristics	Frequency (%)
Age	
<35	24 (32.0)
35-44	13 (17.3)
45-54	17 (22.7)
55-64	19 (25.3)
≥65	1 (1.3)
Did not specify	1 (1.3)
Sex	
Male	24 (32)
Female	47 (62.7)
Did not specify	4 (5.3)
With postgraduate degree and/or continuing education	44 (58.7)
Type of postgraduate degree and/or continuing education (possible to have multiple answers)	
Master's degree	7 (9.3)
PhD	2 (2.7)
Preceptorship	25 (33.3)
Short courses	17 (22.7)
Others	6 (8.0)
Years in Practice	
<10	27 (36.0)
10-19	16 (21.3)
20-29	19 (25.3)
>30	13 (17.3)
Monthly Income (in PhP)	
<30,000	18 (24)
30,000- 50,000	18 (24)
51,000- 70,000	16 (21.3)
>70,000	13 (17.3)
Others:	
No longer in practice	1 (1.3)
Semi-retired	1 (1.3)
Did not specify	8 (10.7)

Referral Pattern to Periodontists

When asked if they were acquainted with a periodontist, only 23 participants (30.7%) responded affirmatively, while 47 (62.7%) indicated that they did not personally know any periodontist. Five participants did not answer the question. On the other hand, when asked whether the participant's dental clinic was in proximity to a periodontist, an even lower percentage (14.7%) claimed that a periodontist practiced nearby.

The participants' preference in referring periodontal patients to a specialist can be seen in Table 3. Majority (80%) prefer to refer patients with periodontal disease to a periodontist for disease management. In terms of number of referrals, 76% of the participants estimated having referred <10 periodontal patients per month. A summary of the monthly periodontal referrals of all participants is reported in Table 3.

General Factors Affecting Patient Referral to Periodontists

Several general factors, both clinical and non-clinical, affect the participants' decision to refer patients to a periodontist. The different factors, as well as the percentage of dentists who consider such factors, are presented in Figure 3.

The top two factors taken into account by the participants when referring patients to periodontists are the severity of the periodontal condition and the presence of a complex medical condition, which were considered by 74.7% and 61.3% of the dentists, respectively. Other factors were considered by less than the majority of the participants. Only 24% would factor in their perceived personal skill to manage a periodontal patient. Moreover, the least common factor for patient referral relates to the gender of the patient. Only two (2.7%) of the participants would refer based on patient gender. One respondent would refer male patients, while the other respondent would refer female patients.

Clinical Factors Affecting Periodontal Referrals

Based on questionnaire items pertaining to specific diagnoses and clinical parameters of their patients' periodontal conditions, the type of periodontal disease emerged as the top clinical factor considered by 81.3% of the participants when referring patients to periodontists (Figure 4). Among the listed periodontal conditions, the most frequently referred were cases of necrotizing periodontal diseases (54.1%) and

Table 2. Periodontal Diseases Managed and Estimated Number of Periodontal Patients Seen by the Participants

Characteristics of the Periodontal Practice	Frequency (%)
Periodontal diseases that are treated by the participants	
Gingivitis	65 (86.7)
Periodontitis	46 (61.3)
Estimated number of periodontal patients managed per month	
<10	57 (76.0)
11-20	4 (5.3)
>20	8 (10.7)
Did not specify	6 (8.0)

Table 3. Referral Pattern of the Participants to Periodontists

| Questions and Reponses Pertaining to Periodontal Referral Pattern	Frequency (%)
Do you prefer referring periodontal patients to a specialist?	
Yes	60 (80)
No	9 (12)
Other responses:	
Sometimes	1 (1.3)
Depends on the case	1 (1.3)
Did not respond	4 (5.3)
How many estimated patients with periodontal diseases/conditions do you refer in a month?	
<10	57 (76)
10-20	4 (5.3)
>20	8 (10.7)
Did not respond	6 (8)
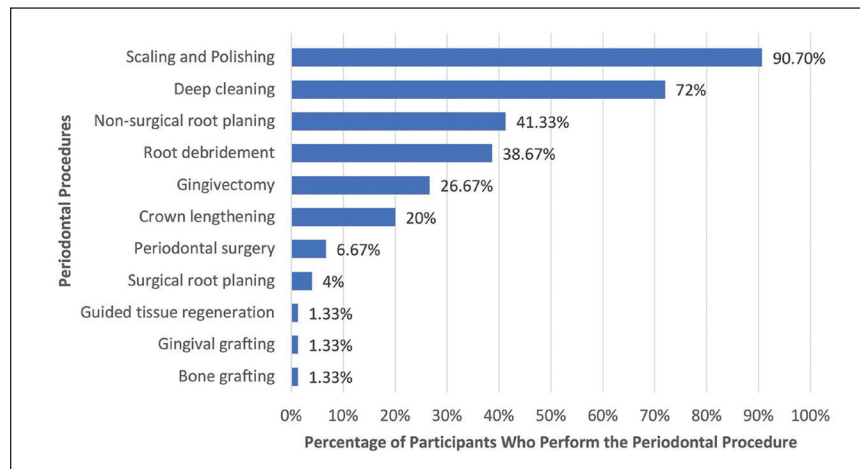
Figure 2. Prevalence of participants who perform varied periodontal procedures.

severe periodontitis (52.5%). All periodontal conditions that would merit a referral from the participants can be seen in Figure 5.

Aside from the type of periodontal disease afflicting a patient, probing pocket depth (PPD) is another clinical factor considered by 65.3% of the participants when making a periodontal referral (Figure 4). Among the 49 respondents who refer based on probing depths, 61.2% would refer

patients with a PPD >5 mm, 28.6% would refer patients with PPD = 4-5 mm, 8.2% would refer patients with PPD of <4 mm, while a lone respondent did not specify the usual probing depths that would be needed to refer the patient to a specialist.

The presence of tooth mobility is the 3rd clinical factor that influenced 61.3% of participants to refer the case to a periodontist. Signs of progressive tooth mobility would be
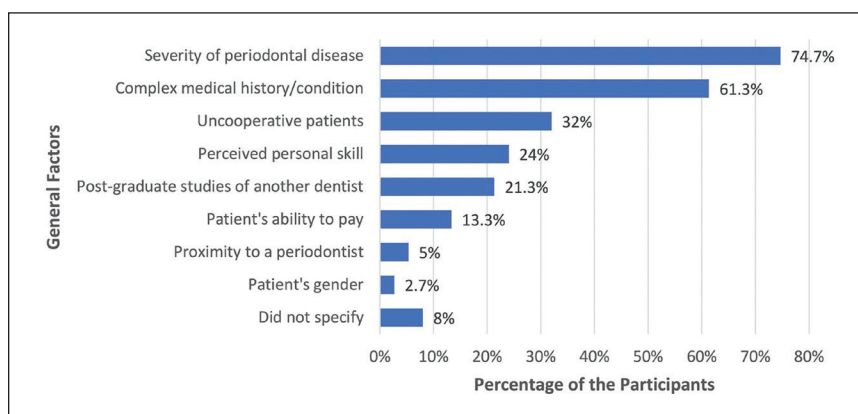
Figure 3. Percentage of participants who consider different general factors when referring patients to a periodontist.
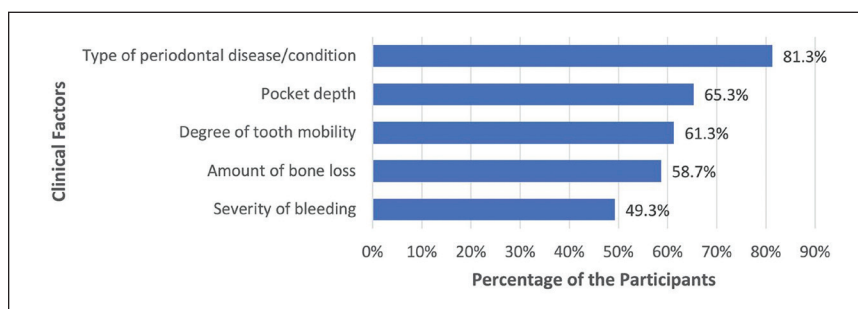
Figure 4. Percentage of participants who consider different clinical factors when referring patients to a periodontist.
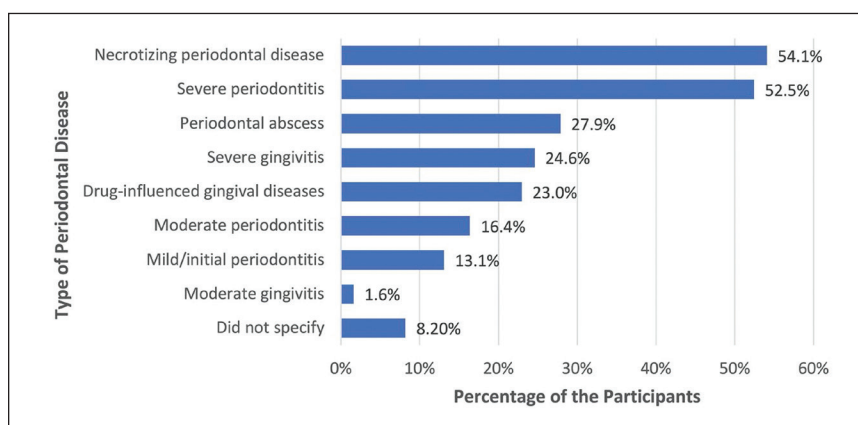
Figure 5. Periodontal patient referrals according to type of periodontal disease.
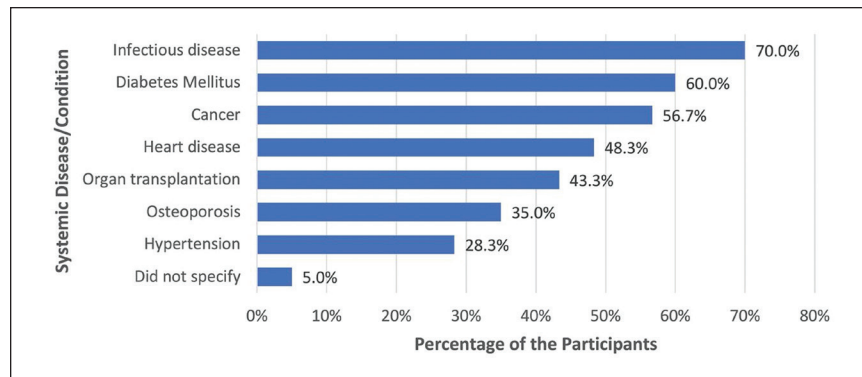
Figure 6. Systemic conditions that influence patient referral by the participants to periodontists.

referred by 41.3% of those who refer based on tooth mobility. This was followed by degree 2 (32.6%), degree 3 (23.9%), and degree 1 mobility (2.2%).

The amount of bone loss observed on patients' teeth is also considered a factor for referral to a periodontist by majority (58.7%) of the respondents. Among the 44 participants who base periodontal referral on bone levels, 40.1% would opt to refer to a specialist when patients present with >50% bone loss. On the other hand, 27.3% would refer periodontitis patients exhibiting >33% bone loss, while 18.2% would already consider having a specialist manage a patient who presents with <33% bone loss. The remaining 13.6% of the 44 participants who consider the amount of bone loss when referring did not specify the bone loss threshold that would make them decide to refer to a periodontist.

The last periodontal parameter that influences patient referral to a periodontist is the severity of bleeding on probing noted by the participants on initial examination of their patients, with almost half of the participants (49.3%) having indicated considering the clinical factor. Out of the 37 participants who refer based on bleeding severity, 48.6% would refer to a specialist if pooling of blood were observed upon probing. Others would refer once linear bleeding (16.2%), pinpoint (2.7%), and even no bleeding (5.4%) are observed. The remaining 27% of the 37 participants who consider the severity of bleeding for patient referral did not specify the nature of bleeding that would make them decide to refer to a periodontist.

Finally, aside from the periodontal diagnosis and the parameters observed upon assessment, a patient's systemic condition or medical history would be one clinical factor that could serve as basis to refer management to a periodontal specialist, as presented earlier in Figure 3. Specifically, among the participants who refer based on medical status, majority would prefer that a periodontist treat patients with infectious diseases (70%), diabetes mellitus (60%), and cancer (56.7%). These three aforementioned systemic conditions and other comorbidities considered for referral to a specialist by the respondents are shown in Figure 6.

DISCUSSION

This study assessed the periodontal referral patterns of general dentists who practice in the City of Manila. To the authors' knowledge, there is no previous research that has looked into the decision making of Filipino dentists when they pass on management of periodontal patients to a specialist. In this present study, 92% of the participants indicated that they regularly referred patients with periodontal disease to periodontists, with a personal estimate of up to 20 periodontal case referrals monthly by 81.3% of the participants and >20 referrals for 10.7%. In contrast, Zemanovich et al. reported a relatively higher percentage (97.8%) of general dentists practicing in Virginia, USA who claimed to refer patients to periodontists, but with a lower number of monthly referrals (≥3 patients) among 62.2% of the general dental practitioners.[16] Although the 92% prevalence of Manila dentists who refer to periodontists may also be considered high, a possible explanation for the relatively lower prevalence compared to that in the study by Zemanovich et al. may be the perceived proximity of the Manila dentists' clinics to periodontal specialists' clinics. Eighty percent of the study participants claimed that their dental offices are not located in close proximity to a periodontist's clinic. In a study by Linden et al., general dentists whose practices were farther away from a periodontist were observed to have a lower referral rate compared to general dentists in Northern Ireland whose clinics were in closer proximity to a specialist.[15] Likewise, long distance between the general dentist and periodontist's practice locations has been identified as a factor that prevents patient referral in a study by Sharpe et al.[17] On the contrary, Zemanovich et al., observed the reverse, i.e., dentists whose practices were not in close proximity to a periodontist's clinic were more likely to refer patients compared to those whose location was near a periodontist's clinic.[16]

When comparing the 92% prevalence of general dentists who refer periodontal patients in this present study, Lee et al. reported a relatively lower percentage of Michigan, USA general dentists (76.6%) who claimed to refer patients to

periodontists, with 69.3% referring an average of up to 20 periodontal patients per month (1-5 per week) and 7.3% who referred >20 patients within a month.[9] The authors infer that the present study's referral prevalence is higher, possibly due the dental practice differences in Manila and in Michigan. The GDPs in Michigan all had dental hygienists employed in their clinics, with 86% of the GDPs reporting that their dental hygienists treated periodontal patients, which may have reduced referral to a periodontist.[9]

This study also identified the factors considered by general dental practitioners in their decision to refer periodontal patients to periodontists. These include both clinical and non-clinical factors.

Among the clinical factors identified, the type of periodontal disease was the most cited, with 81.3% of the present study's participants using this as basis for referral to a periodontist. Periodontal disease severity was also an important factor considered by 74.7% of the GDPs in Manila. Specifically, necrotizing periodontal disease and severe periodontitis were the top two conditions that would merit a referral from the participants. The results of this present study are in line with a study in Queensland, Australia by Sum and O'Rourke, wherein 57 GDPs participated in an online survey to analyze the factors affecting periodontal disease referral. In the Australian study, 85.7% of the respondents will refer patients with severe chronic periodontitis, while 87.8% would refer aggressive periodontitis cases.[10] Similarly, the study by Linden et al. reported that the top reason for referral that was cited by 94% of the study respondents, was the assessment that the patients' periodontal diseases were too severe for the respondents to treat in their own dental clinics.[15] Moreover, in a study by Kraatz et al., 81.6% of GDPs in Tasmania, Australia expressed being rarely or never confident in managing severe periodontitis.[11]

Aside from the actual periodontal diagnosis, majority of the participants of the present study indicated pocket depths and tooth mobility as the top two periodontal parameters to be considered when they refer patients to periodontists. Among those participants who refer based on probing depths, 61.2% would refer periodontitis patients with PPD >5 mm. On the other hand, among those who consider mobility in their referrals, progressive tooth mobility would be referred by 41.3%, while 56.5% would refer patients presenting with either degree 2 or 3 mobility. Our study results follow that of Kraatz et al., who reported that dentists are also inclined to refer patients based on the presence of pocket depths >5 mm. Eighty-five percent of the GDPs in the study by Kraatz et al. would refer to a periodontist if PPD is 6-7 mm, while 90.5% would refer if initial periodontal assessment revealed pockets ≥8 mm.[11]

On the other hand, when considering tooth mobility as a factor in periodontal referral, the percentage of Manila dentists who rely on tooth mobility in the present study (62.3%) is comparable to that of the respondents (60.8%) in the same study by Kraatz et al.[11] Moreover, similar to the present study, the general dentists in the study by Sum and O'Rourke also consider progressive tooth mobility as a clinical factor in deciding not to personally manage a periodontitis patient. Almost 84% will either definitely refer or will be likely to refer based on findings of progressive tooth mobility.[10]

Referral from Manila GDPs to periodontists can also be highly influenced by a patient's health status. Eighty percent of the participants identified the patient's systemic condition as a factor in their referral decision, making it the next important factor for referrals, after the type and severity of periodontal disease. Similarly, the medical status would be an important consideration for periodontal referral in the study by Linden, where 74% of GDPs would decide to refer patients with complex medical history or systemic comorbidities.[15] Moreover, the general dentists in the studies of Ghiabi and Matthews and Kraatz et al. also consider the same factor, albeit with lower percentages (37.9% and 56.8%, respectively) of the respondents choosing to refer because of a patient's medical history.[12,13]

When asked to identify specific systemic conditions that would warrant a referral to a periodontist, the participants in the present study selected infectious diseases (70%), diabetes mellitus (60%), and cancer (56.7%). In the study by Sum and O'Rourke, the general dentists who served as respondents will consider periodontal referral if a patient has any of the following: compromised immune system, diabetes, undergoing cancer treatment, and cardiovascular disease.[10] According to the American Academy of Periodontology's guidelines for the management of periodontal patients, except for infectious diseases, periodontitis patients with any of the other mentioned systemic conditions may benefit from co-management by both a periodontist and a general dentist.[7]

Aside from clinical factors, several non-clinical factors were identified by the study participants as considerations when deciding to refer patients to periodontists. However, compared with clinical factors, these non-clinical factors are not as influential in the decision-making process, based on the generally low prevalence of participants who indicated such factors.

Twenty-four percent of the study participants admitted that their perceived skill level is a factor in periodontal referral. In contrast, other studies have reported much higher prevalence (≥79%), with the general dentists' personal assessment of training or experience adequacy serving as the top non-clinical factor in deciding to refer to a periodontist.[10,12] The lower prevalence among the present study participants may possibly be explained by the reported nature of the participants' periodontal practices. More than 40% perform nonsurgical root planing, while majority perform scaling and deep cleaning, which is a layman's term for scaling and root planing. It may be advisable that future studies ask whether the general dentists have taken continuing education courses in periodontics and to ask the confidence level of the dentists in managing periodontitis patients, so that these may be correlated with their identified factors for periodontal referral.

Another non-clinical factor identified by the participants was the location of the clinic relative to a periodontist's office. Previous research has likewise reported on the use of such a factor in deciding whether to refer a periodontitis patient,[15,16] and the association between periodontal referral and the proximity between the general dentist and periodontist's clinics has been discussed earlier.

Other factors considered by the study participants were the patient's ability to pay, and if patients were uncooperative. Similarly, patients' financial status and the expected expenses that come with treatment by a specialist are factors that have been identified in previous investigations.[10,13,17] Moreover, patient-related factors such as difficult patients and reluctance or refusal to be referred have also been previously reported.[10,13,16]

The limitations of this present research should be considered when interpreting the results. First, the study yielded a low response rate (31.1%) and did not meet the computed sample size. Therefore, the results may not represent the entire population of general dentists practicing in Manila, nor all Filipino dentists. For future studies, the authors recommend a larger sample size and the use of a nationally representative sample of Filipino GDPs. Moreover, studies may aim to increase response rates by using multiple means of dissemination of surveys, i.e., through mail, email, and multiple onsite survey administration during various dental seminars. Ensuring that future studies have sufficient sample size will also permit correlational analysis. The authors recommend that the association of referral pattern, factors affecting periodontal referral, and the Filipino GDPs sociodemographics be determined.

Another limitation is the possible response bias that comes with self-reporting. Participants may have tailored their answers to what they perceived to be acceptable. Recall bias may also have occurred, resulting in overreporting and/or underreporting, thereby affecting the overall accuracy of the study's results.

CONCLUSION

Multiple factors affect the decision of general dental practitioners in the City of Manila when referring patients to a periodontist. Majority are influenced by clinical factors such as the type and severity of periodontal disease and the systemic condition of the patient. Although considered to a much lesser degree compared to clinical factors, the top non-clinical factors that Manila GDPs base their referral decisions include the assessment that a patient is uncooperative and the perceived adequacy of personal skills in managing periodontal patients.

Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

All authors declared no conflicts of interest.

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