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Knowledge Regarding Orthodontic Triage among General Dental Practitioners of Nepal: A Cross – Sectional Study

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Abstract

Introduction: The general dental practitioner plays a pivotal role in identifying and referring to specialist care, identified as orthodontic triage. The available data reflects limited knowledge regarding various aspects of orthodontic triage and proper referral among general dental practitioner. The aim of this study was to assess the knowledge regarding orthodontic triage among general dental practitioners of Nepal.

Methods: An analytical cross-sectional study design was used. The study was carried out among the dental practitioners of the Nepal via electronic participation. The researcher developed Google forms that were sent by personal emails to the registered general dental practitioners. The total of 189 responses were collected through convenience sampling technique. For analysis, descriptive statistics using frequency, mean, percentage, and standard deviation were used. To examine association, chi-square test was used.

Results: The result of this study showed that overall knowledge score was high among two-third (63.5%) of respondents and 36.5% had low level of knowledge. No significant association was found between level of knowledge and demographic characteristics.

Conclusion: The study concluded that though majority of the respondents had high level of knowledge on orthodontic triage, majority possessed low knowledge on various aspects of the triage. This is important in identifying and referring to the specialist care.

Keywords: general dental practitioner; knowledge; orthodontic triage

Introduction

The general dental practitioner plays a pivotal role in identifying and referring to the specialist care. The knowledge and previous experience influence decision making of dental practitioner for mentioning orthodontics care to the needy. Thus, the knowledge regarding the orthodontic triage among general dental practitioner has been key factor in shaping or prioritizing the management of orthodontic problems.[1] According to the WHO, triage is the medical process of prioritizing the management needs of individual patient who approaches to the health services. This is basically a decision-making process based on patients' characteristics, the care provider and health-care setting.[2]

A study done in Iran with 384 general dental practitioners revealed that 80% possessed good knowledge on orthodontic management, however knowledge level was inadequate or poor in aspects of timing and referral of cases.[3] Another study done in Pakistan among 112 dental health care professional showed that only 40% were familiar with orthodontic triage and among them, 79% even denied using triage.[4] A study done in the Eastern Nepal showed the prevalence of malocclusion as Class I, Class II division 1, Class II division 2 and Class III malocclusion to be 49.11%, 11.43%, 4.03%, and 12.24%, respectively. The prevalence of orthodontic treatment needs recommended

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in the study was 70.06% for slight or no need, 18.67% for elective need, 7.76% for highly desirable need, and 3.52% for mandatory need.[5] Regarding global situation of use of orthodontics, a US based study showed that among sample of 12,422, the total of 491 reported to use orthodontics treatment.[6]

In light of the reported studies above, the study was designed to assess the knowledge regarding orthodontic triage among general dental practitioners of Nepal. The study helps to find baseline data on level of knowledge among dental practitioner regarding orthodontics triage which is helpful for researcher in similar field. The study determines the level of knowledge in terms of high and low. The study also is helpful to identify knowledge gap and potential risk of inappropriate triage and delayed referral.

Methods

A quantitative, analytical cross-sectional study design was used to evaluate the level of knowledge regarding orthodontic triage among general dental practitioners of Nepal. The study was carried out all over Nepal based on feasibility of researcher to circulate the questionnaire via electronic participation.

The study population included all the registered general dental practitioners who are practicing dentistry for at least one year in any sector. The convenience sampling technique was used. Based on the reported 40% familiarity of the participants with orthodontic triage, the sample size was calculated using the Cochrane formula for unknown population (using prevalence of 0.4)[4] and the precision level of 7% (to account for the expected sub-optimal response rate). The calculated sample size was 189.

The data collection tool was self-structured questionnaire, Google forms developed by the researcher after necessary literature review. The questionnaire consisted of two parts: Part I was about the demographic information consisting of age, experience and academic qualifications of respondents. Part II was about the knowledge regarding orthodontic triage. It consisted of total 13 questions, however, knowledge related items were till question no. 11 with each having one correct answer. The tool was pretested in the representative 10% of the general dental practitioners (who were subsequently not included in the final analysis). Pretesting showed acceptable internal consistency (Cronbach's alpha = 0.78), prompting only minor revisions for clarity.

Ethical approval was obtained from Institutional Review Committee (IRC), Nepal APF hospital (NAPFH-04/041/2025). The questionnaire was developed in English language using a Google form. The participants were traced by researcher's through personal contact and then form was sent to each participant through online (e-mail, Viber, WhatsApp) by researcher personal address. On receiving and clicking the link the participants were auto directed to the information about the study. After they accepted to take the survey, then a set of several questions appeared sequentially, which the participants could answer. It took about 20 minutes to fill the Google form. The total of three-week duration was given to fill up and return the form with reminder given after every two days, in between. The form was set up in such a way that one participant could only submit one form with one address.

Statistical Analysis: A well-structured database was developed after data screening. The collected data as stored in password protected file on the personal laptop. Preliminary analysis consisted of cleaning and coding the collected data to prepare it for further analysis in SPSS (Statistical Package for Social Science). The SPSS version 21 was used for data analysis. For the data analysis, descriptive statistics using frequency, mean, percentage, and standard deviation were used. To examine association, chi-square test was used. The significance level was defined at $p<0.05$ at 95% confidence intervals (CI).

Results

The study participants constituted 189 general dental practitioners who responded to the online survey. Table 1 reflects the participants' profile, and majority (60.3%) had work experience of 1-5 years after completion of their undergraduate degree, BDS. Also, 60.3% were female respondents and 69.8% had only the bachelor degree in dental surgery.

Table 1: Demographic and other baseline characteristics of the participants

Variables	Frequency	Percentage
Years of experience (after Bachelor of Dental surgery)		
1-5 years	114	60.3
6-10 years	45	23.8
11-15 years	21	11.1
>15 years	9	4.8
Gender		
Male	75	39.7
Female	114	60.3
Academic qualification		
Bachelor's degree	132	69.8
Master's degree in dentistry other than orthodontics	57	30.2

As depicted in the table 2, almost all of the respondents (95.2%) correctly answered the meaning of orthodontics triage. Only 38.1% correctly identified that appropriate age to begin orthodontic evaluation as 6-7 years. The correct response as immediate refer to orthodontist for intervention of single tooth cross bite, functional shift of mandible and ectopic eruption as 76.2%, 58.7% and 47.6% respectively. Only half (47.6%) correctly identified that supernumerary teeth should be extracted. Majority

(93.7%) know about appropriate intervention for maxillary midline diastema of less than 2mm is to wait and watch till canines erupt. Only one-third (33.3%) responded correctly that refer for treatment after growth spurt is to be done for proclined maxillary and mandibular incisors with class 1 skeletal relation in mixed dentition.

Table 2: Knowledge of the participants regarding orthodontics triage

Variables (Questions)	Frequency	Percentage
Meaning of Orthodontic triage		
Assess the preadolescence to rule out early intervention needed and complexity of problem	180	95.2
Assess and design functional appliances as per need of any age of patient	3	1.6
Assess and design better brackets for fixed orthodontic treatment for complex cases	6	3.2
Appropriate age to begin orthodontic evaluation		
3-5 years	21	11.1
6-7 years	72	38.1
10-12 years	96	50.8
Most appropriate intervention for clinically Class 3 profile with obvious maxillary deficiency in mixed dentition with anterior cross bite		
Refer the patient after growth spurt ends	9	4.8
Refer the patient immediately to orthodontist	162	85.7
Wait for growth spurt and refer the patient to orthodontist	18	9.5
Most appropriate intervention for Class 2 malocclusion with mandibular deficiency		
Refer the patient after growth spurt ends	12	6.3
Refer the patient immediately to orthodontist	117	61.9
Wait for growth spurt and refer the patient to orthodontist	60	31.7
Most appropriate intervention for Class 1 crowding with severe crowding in mixed dentition		
Refer the patient after growth spurt ends	27	14.3
Refer the patient immediately to orthodontist	114	60.3
Wait for growth spurt and refer the patient to orthodontist	48	25.4
Most appropriate intervention for patient with single tooth cross-bite in mixed dentition		
Refer the patient after growth spurt ends	15	7.9
Refer the patient immediately to orthodontist	144	76.2
Wait for growth spurt and refer the patient to orthodontist	30	15.9
Most appropriate intervention for functional shift of mandible during intercuspation		
Refer the patient after growth spurt ends	24	12.7
Refer the patient immediately to orthodontist	111	58.7
Wait for growth spurt and refer the patient to orthodontist	54	28.6
Intervention for ectopic eruption of teeth		
No need to do the treatment it gets in position by itself	15	7.9
Refer the patient immediately to orthodontist	90	47.6
With till all the teeth erupt so fixed orthodontic treatment can be done	84	44.4
Intervention for supernumerary teeth in mixed dentition		
Immediately extract the supernumerary teeth	90	47.6
Wait till adolescence for the fixed orthodontic treatment	39	20.6
Wait till the supernumerary teeth erupts and then extract	60	31.7
Most appropriate intervention for maxillary midline diastema of less than 2 mm		
Refer the case immediately for fixed orthodontic treatment	6	3.2
Wait and watch till canines erupt	177	93.7
Wait till adolescence	6	3.2
Most appropriate intervention proclined maxillary and mandibular incisors with class 1 skeletal relation in mixed dentition		
Refer for treatment after growth spurt	63	33.3
Refer immediately for fixed orthodontic treatment	78	41.3
Refer patient before growth spurt	48	25.4

The table 3 shows that almost half (47.6%) were somewhat familiar about index of orthodontic treatment need (IOTN) and 63.5% were somewhat confident in identifying orthodontic cases that require immediate intervention.

Table 3: Participants familiar and confident with orthodontic treatment

Variables (Questions)	Frequency	Percentage
Are you familiar with index of orthodontic treatment need (IOTN)?		
Very familiar	18	9.5
Somewhat familiar	90	47.6
Not familiar	81	42.9
How confident are you in identifying orthodontic cases that require immediate intervention?		
Very confident	36	19
Somewhat confident	120	63.5
Not confident	33	17.5

As illustrated in table 4, the mean knowledge score of the participants was 6.22±1.82. The overall knowledge score shows that about two-third (63.5%) has high level of knowledge and one-third (36.5%) of respondents has low level of knowledge. There was no significant association between level of knowledge and demographic variables (p-value: >0.05)

Table 4: Overall level of knowledge regarding orthodontic triage

Overall knowledge score	Frequency	Percentage
Low level of knowledge (<mean score)	69	36.5
High level of knowledge (≥mean score)	120	63.5

Discussion

The present study shows that majority of the participants, 114 (60.3%) had work experience of 1-5 years. Similarly, 114 (60.3%) were female participant. Also 132 (69.8%) had education level of bachelor in dentistry. The overall level of knowledge in current study shows that about two-third (63.5%) had high level of knowledge and one-third (36.5%) of respondents had low level of knowledge. Also, mean knowledge score of present study is 6.22±1.82 out of 11. Almost all of the respondents (95.2%) correctly answered the meaning of orthodontics triage.

The study done in Pakistan by Ikram showed that regarding the knowledge of triage, 40% of dental practitioners were only familiar with the word "orthodontic triage" while being unaware of how it works (p = 0.753).[2] Another study done in Iran among 384 general dentists showed that the mean knowledge was 17.3 ± 3.5 out of 30, thus indicating a moderate level of knowledge among participants.[3]

The current study shows that only 38.1% correctly identified that appropriate age to begin orthodontic evaluation as 6-7 years. In one study done in Nepal among 185 general dentist and non-orthodontics specialist, around 40% of the participants were not aware that first orthodontic evaluation should be done around 7-8 years.[8]

The present study further shows that the correct response as immediate referral to orthodontist for intervention of single tooth cross bite, functional shift of mandible and ectopic eruption were 76.2%, 58.7% and 47.6% respectively. Only half (47.6%) correctly identified that supernumerary teeth should be extracted. In a study conducted in the Nepalese participants, it was reported that around 93.5% Thought certain temporomandibular joint disorders could be cured by orthodontic treatment, whereas 66.48% of the participants thought orthodontic treatment couldn't be performed in periodontally compromised cases. Around 53.51% of the participants thought that orthodontic treatment could be done in special health care need patient.[8] In another study conducted in Pakistan, the findings showed that 77% reported referral of young patients with orthodontic findings instead of impartment of treatment in their general setups (p = 0.350), while 42% preferred extraction as the management of supernumerary teeth.[2]

In the present study, majority (93.7%) had proper knowledge about appropriate intervention for maxillary midline diastema of less than 2 mm, that is to wait and watch till canines erupted. Only one-third (33.3%) responded correctly about the need to refer for treatment after growth spurt in proclined maxillary and mandibular incisors with class 1 skeletal relation in mixed dentition.

Likewise, similar to the findings of this study, the study done by Acharya et al also showed that there was no significant difference between the mean score of knowledge among general dentists and non-orthodontic specialists (p=0.891).[8] The present study was able to do country wide coverage of dental practitioner so larger coverage was possible even in short duration, however, in-depth survey with physical method of data collection would add more value to the present study.

There were several limitations inherent to the present study, owing mainly to its design. Due to the self-administered nature of the questionnaires distributed via the online platform, proper supervision of the correctness of the responses could not be performed leading to the possibility of missing out important information. Likewise, randomness of the research participants could not be achieved which could have led to skewness in the responses, again missing out significant dental practitioners with knowledge, or conversely without necessary knowledge regarding the orthodontic triage.

Conclusion

The study concluded that nearly two-third of the respondents had high level of knowledge on orthodontic triage, yet majority possessed low knowledge on various aspects of orthodontic triage, immediate referral and treatment. The present study recommends regular upgrade of education through continuing dental education for dental practitioners in various local sector and also need to emphasize it in curricular level.

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