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Orthodontic Knowledge and Awareness among Medical Students of a Tertiary Medical College

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ABSTRACT

Background

Orthodontics, a vital branch of dentistry dedicated to correcting malalignment and malocclusion, stands as a prime example of such a specialty that frequently finds itself overlooked within the medical community. This study aims to evaluate the levels of orthodontics knowledge and awareness of medical faculty students and future medical doctors.

Methods

A cross-sectional study was conducted among 296 students of College of Medical Sciences and Teaching Hospital from January 2024 to May 2024. Ethical approval was taken from Institutional Review Committee of College of Medical Sciences. Then data was entered in Excel and data was analyzed by using SPSS 18. Data was analyzed by using descriptive and inferential statistical tools. p-values less than 0.05 were considered as statistically significant.

Results

This research was conducted among 41.6% female and 58.4% were male. This research showed that 62.2% respondents had good knowledge and awareness of orthodontic (with 95% CI 56.67% to 67.73%). Also, 65.9% female and 59.5% male had good knowledge and awareness on orthodontic likewise, 66% clinical and from pre-clinical side 58.5% had good level of knowledge and awareness on orthodontic. This research showed that there is no association between gender and level of knowledge and awareness (p-value>0.05).

Conclusions

This research showed that more than sixty percentage respondents had good knowledge on orthodontics likewise more than ninety percentage respondents know the meaning of orthodontics.

Keywords: orthodontics, dental, student, Nepal.

INTRODUCTION

In the intricate landscape of healthcare, the synergy between various specialties' is crucial for delivering comprehensive patient care. Despite this interdependence, there often exists a noticeable gap in understanding and appreciation for disciplines outside one's primary field of study. Orthodontics, a vital branch of dentistry dedicated to correcting malalignment and malocclusion, stands as a prime example of such a specialty that frequently finds itself overlooked within the medical community,[1] particularly among medical students. According to the World Health Organization, malocclusion is defined as a dental and/or skeletal anomaly causing aesthetic impairment or impaired function, which may be an obstacle for emotional and well-being to the patients requiring orthodontic treatment.[2] Malocclusion is the third most common oral health problem in the world, and it is often associated with improper oral hygiene, periodontal disease, temporomandibular joint disorders, speech problems, mouth breathing and many other complications.[3] Orthodontic interventions extend far beyond mere cosmetic enhancements, encompassing significant

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functional and health-related implications. Because orthodontic therapy ensures that the teeth are properly aligned and creates a harmonious occlusal and jaw relation, it may frequently correct these issues, or at least stop them from getting worse on early detection.[4] Numerous research findings highlight the significant involvement of medical professionals in tasks such as screening for oral diseases, providing emergency treatment, managing pain, and handling trauma cases. Nonetheless, several studies have revealed a lack of adequate dentistry knowledge among both practicing medical professionals and medical students.[5] Orthodontics involves interdisciplinary collaboration with various medical specialties, such as otolaryngology, pediatrics, and orofacial surgery. However, the lack of awareness and understanding among medical students regarding orthodontic principles, techniques, and indications can inadvertently hinder interdisciplinary collaboration and comprehensive patient care.[6] Therefore, communication barriers between dental and medical professionals, compounded by limited orthodontics awareness among physicians, may impede effective teamwork and holistic patient management. Thus, this study aims to evaluate the levels of orthodontics knowledge and awareness of medical faculty students and future medical doctors.

METHODS

A cross-sectional analytical study was conducted among 296 students of College of Medical Sciences and Teaching Hospital from January 2024 to May 2024. Validity of questionnaire was determined with consulting research expert then this well-structured questionnaire was distributed among students using non probability sampling technique (Convenient sampling). By taking unknown prevalence (p=50% and q=50%), 6% level of significance (The z-score value at 95% Confidence interval is 1.96) and with 5% margin of error. Sample size was determined by using the formula $(n)=Z^2pq/e^2= (1.96*1.96*0.50*0.50)/(0.06*0.06) = 267$. The optimum sample size for required for this study was 267 but study was conducted among 296 and faculty. Ethical approval was taken from Institutional Review Committee of College of Medical Sciences (Ref No. COMSTH-IRC/2024-015). At the time of data collection verbal consent with signature was taken from all students and faculty. Collected data was check for completeness and then coded with numbering. Then data was entered in Excel and data was analyzed by using SPSS 18. Data was analyze by using descriptive and inferential statistical tools. In the descriptive statistics for categorical variable frequency and percentage were calculated. In the inferential statistics to find the association between dependent variable (level of knowledge and awareness) and independent variables, Chi-square test was used. p-values less than 0.05 were considered as statistically significant.

RESULTS

The response of 296 students and faculties were collected in this research. Finding showed majority of the respondents were male 173(58.4) by gender followed by female 123(41.6). Regarding the source of information on oral health, 44.3% get from Dentist, 13.5% from Doctor/Nurse and TV/Radio. Regarding the level of education 51.7% were clinical and 48.3% were in pre-clinical (Table 1).

Table 1. Sociodemographic information of respondents. (n=296)

Sociodemographic variables	Frequency (%)
Gender	
Female	123(41.6)
Male	173(58.4)
Source of information on oral health	
Dentist	131(44.3)
Doctor/Nurse	40(13.5)
Lectures /Seminar	32(10.8)
Magazine/Books	34(11.5)
Others	19(6.4)
TV/Radio	40(13.5)
Level of education	
Clinical	153(51.7)
Pre-clinical	143(48.3)

Following table showed the knowledge and awareness of respondents on each question. This showed that, 90.2% respondents know the meaning of orthodontics, 52% know the orthodontics involve malocclusion and its management, 50.3% know filling be made by orthodontics, 59.8% know the extraction teeth be

carried out by orthodontics, 50.3% know the scaling be made by orthodontics (Table 2).

Table 2. Knowledge and awareness of respondents on each question of orthodontic. (n=296)

Questions	Frequency (%)
Meaning of orthodontics	267(90.2)
Orthodontics involve malocclusion and its management	154(52.0)
Filling be made by orthodontics	149(50.3)
Extraction teeth be carried out by orthodontics	177(59.8)
Scaling be made by orthodontics	149(50.3)
Polishing teeth be carried out by orthodontic	134(45.3)
Aligning teeth be made by orthodontics	246(83.1)
Dentures be applied by orthodontics	226(76.4)
Braces be applied by orthodontics	250(84.5)
Removable appliance be applied by orthodontics	206(69.6)
Appearance be affected by malocclusion	229(77.4)
Speech be affected by malocclusion	211(71.3)
Quality of life be affected by malocclusion	212(71.6)
Self-esteem be affected by malocclusion	233(78.7)
Mastication be affected by malocclusion	236(79.7)
Doctors refer patients to orthodontics	272(91.9)
Doctors refer patients to medical doctors	175(59.1)

This research showed that 62.2% respondents had good knowledge and awareness of orthodontic (with 95% CI 56.67% to 67.73%) (Table 3).

Table 3. Level of knowledge and awareness on Orthodontic. (n=296)

Level of knowledge and awareness	Frequency (%)	95% CI	
		Lower	Upper
Good	184 (62.2)	56.67	67.73
Poor	112 (37.8)		

The association between level of knowledge and awareness with gender and level of education is shown in the following table. This showed that 65.9% female and 59.5% male had had good knowledge and awareness on orthodontic. Finding showed that there is no association between gender and level of knowledge and awareness (p-value>0.05). Likewise in the level of education, respondents from clinical side 66% and from pre-clinical side 58.5% had good level of knowledge and awareness on orthodontic. Finding showed that there is no association between gender and level of knowledge and awareness (p-value>0.05).

Table 4. Association between level of knowledge and awareness with gender and level of education. (n=296)

Variables	Level of knowledge and awareness		Chi-square	p-value
	Poor	Good		
Gender				
Female	42(34.1)	81(65.9)	1.21	0.27
Male	70(40.5)	103(59.5)		
Level of education				
Clinical	52(34)	101(66)	3.43	0.179
Pre-clinical	60(41.5)	83(58.5)		

DISCUSSION

This research was conducted among 296 students and faculty, among them 41.6% were female and 58.4% were male. While the study conducted by Sivakumar et al., showed that 49.2% respondents were males while rest were females.[8] Out of the total, 129 (63%) were males and 77 (37%) were females.[8] Regarding the level of education, in this research 51.7% were clinical and 48.3% were in pre-clinical. A cross-sectional study at LASUCOM assessed medical students' knowledge of orthodontics and awareness of malocclusion's impact. 85 students participated, mostly in clinical (75.3%) vs. non-clinical (24.7%) periods.[11] Among them, there were 42 medical doctors, 49 nurses, and 115 medical students. The average age of the participants was 26.7 years with a standard deviation of 5.2.[7] A cross-sectional study was conducted at Sri Balaji Medical College and Hospital, including 375 male and female students from the second to final year. They were chosen randomly and given a self-administered questionnaire, with data analyzed using SPSS version 24.0. The response rate was 70.4% (n=264), with 49.2% men (n=130) and the rest women.[8] In order to get the information, 44.3% get from Dentist, 13.5% from Doctor/Nurse and TV/Radio Likewise, 90.2% respondents know the meaning of orthodontics, 52% know the orthodontics involve malocclusion and its management, 50.3% know filling be made by orthodontics, 59.8% know the extraction teeth be carried out by orthodontics, 50.3% know the scaling be made by orthodontics. Half of the respondents (50.1%) were familiar with the term 'orthodontics'. Among them, 31.4% understood that orthodontics is associated with correcting malocclusion. Additionally, 40.1% had undergone orthodontic treatment themselves. About half (54.5%) had relatives

who were receiving orthodontic treatment during the study period, and 47.4% considered aesthetics the most important aspect affected by malocclusion. Similarly, 56% would recommend orthodontic treatment, while 38.6% mentioned the duration of treatment as a discouraging factor.[8] This research showed that 62.2% respondents had good knowledge and awareness of orthodontic (with 95% CI 56.67% to 67.73%). This showed that 65.9% female and 59.5% male had had good knowledge and awareness on orthodontic. A study conducted by Coote found that 76.5% of the participants visited a dentist for pain in the past year, while only 11.2% went for routine checkups. Only 50.2% were familiar with the term 'orthodontics', and many incorrectly identified orthodontic procedures, with only 27.5% accurately recognizing the treatments offered.[9] Despite 40% of the students experiencing malocclusion and 54.5% having relatives in orthodontic care, many had incorrect perceptions of orthodontics. Overall, there is a notable lack of awareness and understanding of orthodontics among medical students, indicating a need for better education in this area.[9] Türkan Sezen conducted a research among 58.6% preclinical and 41.4% clinical students. Findings revealed 76.2% had heard of "orthodontics," and 41.2% knew it involved malocclusion treatment. For treatment methods, 35.8% mentioned tartar removal, 40% tooth polishing, and 89.9% orthodontic treatment. Additionally, 42.8% believed orthodontists use dentures, 83% braces, and 78.8% removable appliances. The study highlighted a need for increased orthodontic education among medical students.[10] Half knew 'orthodontic', 31.4% knew its relation to malocclusion correction, 40.1% received orthodontic treatment, and 54.5% had a relative who did during the study. 47.4% saw aesthetics as the most affected criterion. 56% were referred to a physician, and 38.6% were disappointed by treatment duration. Female students showed higher awareness of orthodontics, oral health, and beauty compared to males.[8] Only 45.9% knew about orthodontic treatment, and 20% correctly linked malocclusion to it. 54.1% identified orthodontics as a treatment method, with 57.7% recognizing braces for teeth straightening. 81.2% agreed to refer patients for orthodontic treatment, showing limited understanding of orthodontics and malocclusion's health effects.[11]Kaushal Kumar Singh and Babita Singh at National Medical College Teaching Hospital in Birgunj, Nepal, conducted a study on medical students' knowledge, attitudes, and practices regarding orthodontic treatment. Results showed good awareness of malocclusion side effects, though fewer knew about retainers (35.9%). Overall, students had a positive attitude toward orthodontics. However, most (51.1%) opposed removing healthy teeth for orthodontic reasons.[12] This suggests the importance of educational institutions in imparting accurate orthodontic knowledge to enhance students' understanding, foster positive attitudes, and improve practice standards.[12] The majority, 87%, expressed their objective as achieving a stable dental structure upon completing orthodontic procedures. The statistical analysis using the Chi-square test to evaluate respondents' understanding of the recommended permanent retention method after orthodontic treatment for closing widespread gaps yielded a non-significant result, with a p-value of 0.056. Despite limitations, it's apparent that dentists are conscious of the need for a retention device to ensure stability post-orthodontic treatment.[13] Almost all of them (99.5%) were familiar with the dental profession, but a significant portion (92%) had never recommended patients for dental checkups. Surprisingly, around one-third (31%) of medical doctors mistakenly thought Ludwig angina was related to the heart. Additionally, a majority (61%) didn't consider regular dental visits necessary, while 27% preferred visiting a dentist only when experiencing dental issues.[7] There is no association between gender, level of education with level of knowledge and awareness. Female students demonstrated significantly greater awareness than males in understanding orthodontics and in visiting the dentist for routine checkups (p=0.001). Knowledge on tooth alignment differed significantly between women and men (p=0.006) and between preclinical and clinical students (p=0.033). The study found significant correlations between knowledge-attitude (p=0.001), knowledge-practice (p=0.001), and attitude-practice (p=0.015) scores. This suggests the importance of educational institutions in imparting accurate orthodontic knowledge to enhance students'

understanding, foster positive attitudes, and improve practice standards.[12]

CONCLUSIONS

This research showed that more than sixty percentage respondents had good knowledge and awareness on orthodontics likewise more than ninety percentage respondents know the meaning of orthodontics. Fifty percentage respondents made filling by orthodontics. More than half of the respondents are aware of using retention appliances to maintain the stability of corrected teeth after orthodontic treatment. However, this research showed that there is no association between level of knowledge and awareness with gender and level of education.

Conflict of interest: None

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