# Awareness and knowledge of orthodontics: its implications among medical and dental undergraduates at the University of Port- Harcourt, Rivers State, Nigeria.

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**Abstract**

**Objective:** To assess the level of awareness and knowledge of orthodontics, as well as its implications, among medical and dental undergraduates at the University of Port Harcourt, Port Harcourt, Nigeria.

**Method:** A self-administered questionnaire was distributed to 160 medical and dental students in their lecture rooms. The students were in different levels of study; ranging from first year to final year, i.e. both pre-clinical and clinical. The questionnaire examined their awareness and knowledge of orthodontics, as well as their past dental experiences, if any. It also included questions such as whether a medical doctor should refer patients with malocclusion to an orthodontist, and whether respondents would refer patients with malocclusions to an orthodontist. Statistical analyses were carried out with Epi-info version 7.0 on a personal laptop computer.

**Result:** Only 147 (92%) questionnaires were properly completed and analyzed. Dental students were significantly more aware of orthodontics than their medical counterparts ($p = 0.029$). Over half of the students (53.7%) had never heard of the term 'malocclusion'. Majority (91.2%) of those who had heard of the term 'malocclusion' answered correctly that it refers to 'badly arranged teeth', while a quarter of them (25.5%) believed that malocclusion affects appearance alone.

**Conclusion:** Generally, the knowledge of orthodontics as a specialty in dentistry, malocclusion and its impacts, as well as benefits from treatment is very poor among these undergraduates in the College of Health Sciences, University of Port Harcourt. There is a need to include an introductory course in orthodontics in the undergraduate medical curricula.

**Key words: Awareness, Knowledge, Orthodontics, Rivers State, Nigeria.**

## Introduction

Orthodontics, a relatively new practice in Rivers State, Nigeria[1], is a specialty in dentistry concerned with the growth and development of the dentition and oro-facial complex; as well as the prevention, interception and treatment of malocclusion.

Malocclusion has been described as the third most common oral health problem in the world[2] and is often associated with compromised facial and dental aesthetics, inadequate oral hygiene, periodontal disease, temporo-mandibular joint disease, speech problems, mouth breathing and many more complications. In Rivers state, the prevalence of malocclusion has been reported as 88.2%[3], while other rates are 87.7%[4] in Northern Nigeria, 76%[5] in Ibadan, South – Western Nigeria and 84%[6] in Benin, South – South Nigeria. Global rates include 20% in India[7], 30% – 35% in USA[8], 46.4% - 69.3% in Saudi Arabia[9] and 88.1% in Columbia[10].

Nigeria is a developing nation with low and unequal distribution of oral health manpower[11,12] thus, many patients with dental problems report to medical doctors, who are engaged as the primary care givers for a vast majority of oral-related complaints[13]. Cases of malocclusion may not be recognized by medical personnel, and even when identified may not be considered important enough to warrant a referral to an orthodontist; especially as most orthodontic problems are not associated with a high degree of morbidity[14]. Thus many malocclusion cases are left untreated due to ignorance of patients, parents, inadequacy of resources and lack of knowledge about

malocclusion, even among medical personnel[15]. These patients with untreated malocclusion are therefore deprived of benefits of orthodontic treatment, such as improvement of physical function and masticatory efficiency of the jaws, improved oral hygiene, prevention of gum disease and tissue damage, improved facial aesthetics improved self-esteem and confidence[16].

Medical/dental undergraduate students represent the future medical doctors/ general dental practitioners, if well informed, can play a vital role in identification, education, motivation, early treatment of malocclusion and referrals to orthodontists when necessary.

There is a paucity of data about the awareness and knowledge of orthodontics among medical and dental students in Nigeria. The rationale for this study therefore is to assess the level of awareness and knowledge of the medical and dental students in the College of Health Sciences, University of Port- Harcourt, Rivers State in relation to the discipline of orthodontics; its scope, benefits and its implications. This can enable informed decisions to be made regarding their training programmes.

## Materials and method

This was a cross-sectional study carried out among medical and dental students of the College of Health Sciences, University of Port Harcourt, Nigeria. These students were in different levels of study; ranging from first year to final year students (i.e. both pre-clinical and clinical students). The instrument of data collection was a self-administered questionnaire, which consisted of 3 sections. Section "A" contained 3 questions on socio-demographics, section "B" examined respondents' past dental experiences, while section "C" examined respondents' awareness and knowledge of orthodontics. Questions such as whether a medical doctor should refer patients with malocclusion to an orthodontist, whether respondents would refer patients with malocclusions to an orthodontist, and whether they would consider undergoing orthodontic treatment were also included.

Participation was voluntary, and verbal consent was obtained after a thorough explanation of the scope of the research as well as the questionnaire. One hundred and sixty students, ranging from first year to final year completed the questionnaire, which was administered in their lecture rooms and collected back on the same day. All administered questionnaires were retrieved.

Data entered on a Microsoft Excel Worksheet and Epi - info Version 7.0 were analysed. Frequencies were generated for all variables, Chi square tests were performed, and level of significance was set at $< 0.05$.

## Results

A total of 160 questionnaires was distributed and retrieved. One hundred and forty seven (92%) were analyzed, whilst 13 were excluded from the analysis due to the participant not answering more than six questions.

Out of the 147 respondents, 79 (53.7 %) were males and 68 (46.3 %) were females. Medical and dental students were fairly equally represented in the sample (50.4% medical, 49.6% dental). Their ages ranged from 15-45 years, with a mean age of 21.9 $\pm$ 3.8 years. Majority of them were single (96.6%). Table 1 shows the socio-demographics of the respondents.

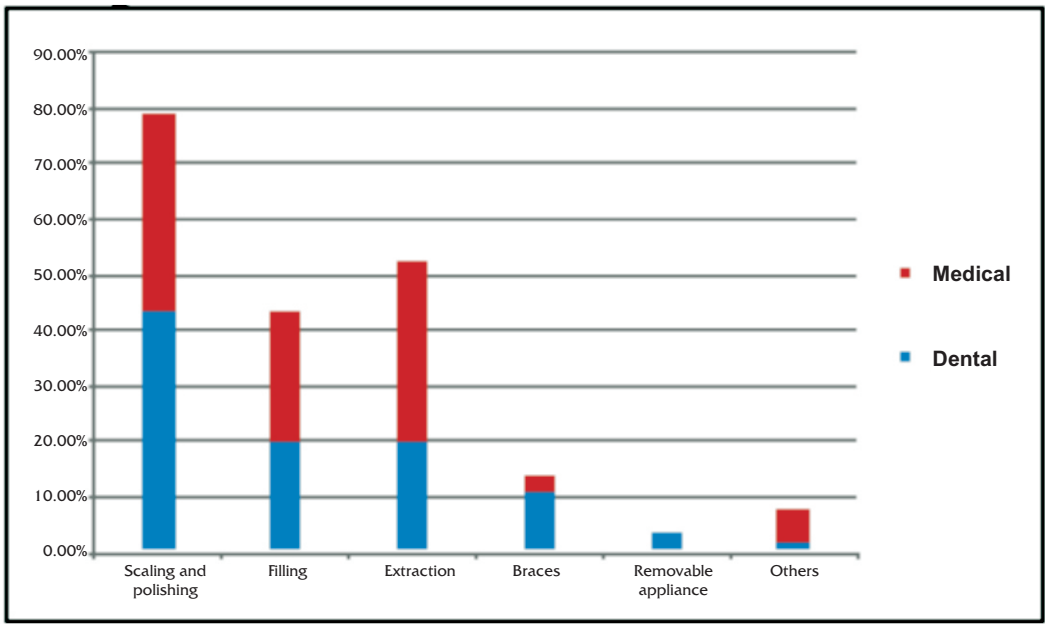
Less than half of the students (43.5%) reported a previous dental visit. The most frequent dental treatment received was scaling and polishing (41%) with only 10.2% stating that they had undergone orthodontic treatment. Figure 1 shows past dental experiences of respondents that had undergone dental treatment.

**Table 1: Socio-demographics of respondents.**

| Age (years) | Dental (n) | % | Medical (n) | % | Total (n) | % |
|---|---|---|---|---|---|---|
| 15 – 19 | 16 | 21.9 | 6 | 8.1 | 22 | 15.0 |
| 20 – 24 | 45 | 61.6 | 58 | 78.4 | 103 | 70.1 |
| 25 – 29 | 11 | 15.1 | 7 | 9.5 | 18 | 12.2 |
| >30 | 1 | 1.4 | 3 | 4.0 | 4 | 2.7 |
| **Gender** | | | | | | |
| Male | 39 | 53.4 | 40 | 54.1 | 79 | 53.7 |
| Female | 34 | 46.6 | 34 | 45.9 | 68 | 46.3 |
| **Year of study** | | | | | | |
| 1 | 11 | 15.1 | 6 | 8.1 | 17 | 11.6 |
| 2 | 13 | 17.8 | 5 | 6.8 | 18 | 12.2 |
| 3 | 7 | 9.6 | 5 | 6.8 | 12 | 8.2 |

| Year of study | Dental (N) | % | Medical (N) | % | Total (N) | % |
|---|---|---|---|---|---|---|
| 4 | 10 | 13.7 | 48 | 64.9 | 58 | 39.5 |
| 5 | 12 | 16.4 | 6 | 8.1 | 18 | 12.2 |
| 6 | 20 | 27.4 | 4 | 5.4 | 24 | 16.3 |
| **Marital Status** | | | | | | |
| Single | 72 | 98.6 | 70 | 94.6 | 142 | 96.6 |
| Married | 1 | 1.4 | 4 | 5.4 | 5 | 3.4 |
| **Previous dental visit** | | | | | | |
| Yes | 37 | 50.7 | 27 | 36.5 | 64 | 43.6 |
| No | 36 | 49.3 | 47 | 63.5 | 83 | 56.4 |
| **Total** | 73 | 100 | 74 | 100 | 147 | 100 |

**Figure 1: Past dental experience of respondents that had undergone dental treatment.**




**Knowledge and awareness of orthodontics**

Majority of the students (60.5%) were aware of the specialty in dentistry called orthodontics with 44.2% of participants indicating correctly that orthodontics had to do with the management of malaligned teeth while 11.6% noted that it had to do with "development of the occlusion". There was a statistically significant difference between the awareness of the dental and medical students about orthodontics with more dental students being aware than medical students ($p = 0.029$). Most of the respondents (68.7%) stated that an orthodontist is "someone who arranges teeth" **(Table 2)**. Over half of the students (53.7%) had never heard the term "malocclusion". Out of those who had heard the term before, 91.2% answered correctly that it referred to "badly arranged teeth" **(Table 3)**.

Whilst 20.4% did not think that the arrangement of the teeth affected any activity, 25.8% of the respondents believed that the arrangement of teeth affects appearance but only 11.7% knew that malocclusion can also affect oral hygiene **(Table 3)**. Sources of the respondents knowledge of orthodontics is depicted in **(Table 4)**.

Over ninety per cent of the students (95.1%) agreed that medical doctors should refer patients with dental problems to the dentist; however, about a quarter (24.5%) said that they would not do so **(Figure 2)**.

**Table 2: Respondents' knowledge of orthodontics**

| Variable | Total N = 147 (%) | Dental N =73 (%) | Medical N =74 (%) | $X^2$ | P |
|---|---|---|---|---|---|
| Aware of orthodontics | 89 (60.5) | 58 (79.5) | 31 (41.9) | 4.79 | 0.029 * |
| **The practice of orthodontics involves** ** | | | | | |
| | **N = 169** | **N = 80** | **N = 89** | $X^2$ | P |
| Scaling and polishing | 6 (3.6) | 1 (1.2) | 5 (5.6) | 1.13 | 0.144 |
| Oral Hygiene maintenance | 7 (4.1) | 5 (6.3) | 2 (2.3) | 0.75 | 0.194 |
| Replacement of missing teeth | 29 (17.2) | 15 (18.8) | 14 (15.7) | 0.06 | 0.814 |
| Development of occlusion | 17 (10.1) | 11 (13.7) | 6 (6.7) | 1.23 | 0.266 |
| Management of malaligned teeth | 65 (38.4) | 30 (37.5) | 35 (39.3) | 0.00 | 0.987 |
| Management of oral manifestations of systemic diseases | 17 (10.1) | 6 (7.5) | 11 (12.5) | 0.48 | 0.487 |
| Extraction of teeth | 11(6.5) | 3(3.7) | 8(8.9) | 0.96 | 0.326 |
| Do not know | 17(10.0) | 9(11.3) | 8(8.9) | 0.03 | 0.852 |
| **Who is an orthodontist? An orthodontist** | | | | | |
| Extracts teeth | 10 (6.8) | 2 (2.7) | 8 (10.8) | 2.22 | 0.060 |
| Fills teeth | 5 (3.4) | 3 (4.1) | 2 (2.7) | 0.00 | 0.50 |
| Cleans teeth | 3 (2.0) | 2 (2.7) | 1 (1.4) | 0.00 | 0.50 |
| Arranges teeth | 101(68.7) | 52 (71.2) | 49 (66.2) | 0.02 | 0.878 |
| Treats children's teeth | 5(3.4) | 1 (1.4) | 4 (5.4) | 0.72 | 0.395 |
| Don't know | 23 (15.6) | 13 (17.8) | 10 (13.5) | 0.15 | 0.698 |

** Multiple answers

**Table 3: Respondents' knowledge of malocclusion.**

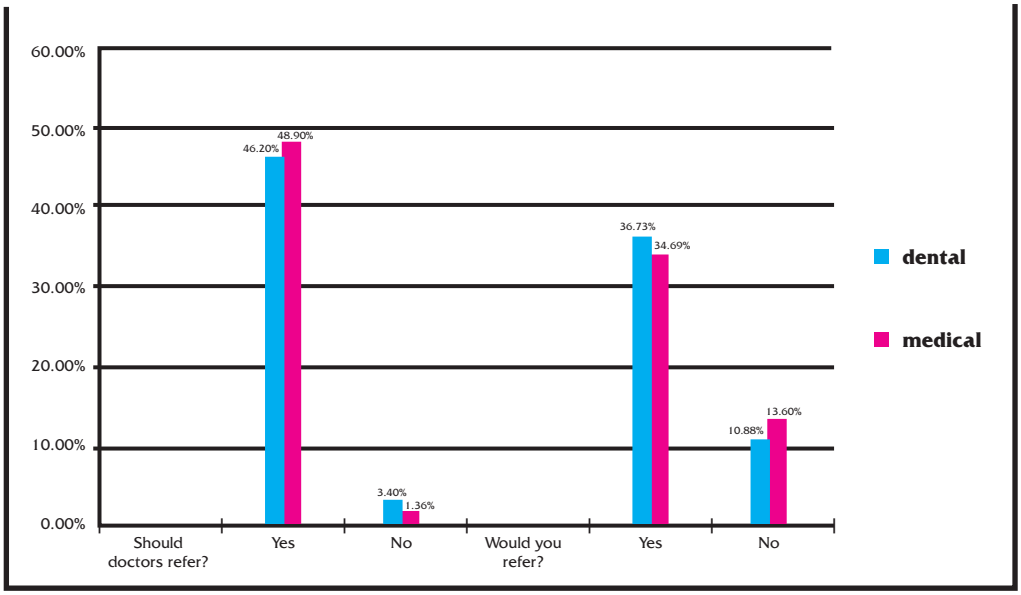
| Variable | Total N = 147 | Dental N = 73 | Medical N = 74 | $X^2$ | P |
|---|---|---|---|---|---|
| **Heard of malocclusion** | | | | | |
| Yes | 68 (46.3) | 37 (50.7) | 31 (41.9) | 0.25 | 0.616 |
| No | 69 (53.7) | 30 (41.1) | 39 (52.7) | 0.49 | 0.483 |
| Don't know | 10 (6.8) | 6 (8.2) | 4 (5.4) | 0.09 | 0.381 |
| **If yes, what is malocclusion** | | | | | |
| Hole in tooth | 1(1.5) | - | 1 (3.2) | 0.01 | 0.463 |
| Bleeding gum | 3 (4.4) | 2 (5.4) | 1 (3.2) | 0.00 | |
| Bad arrangement | 62 (91.2) | 35 (94.6) | 27 (87.1) | 0.00 | 0.954 |
| Swelling | 2 (2.9) | - | 2 (6.5) | 0.64 | 0.218 |
| **Can the arrangement of the teeth affect daily activities?** | | | | | |
| Yes | 117 (79.6) | 58 (79.5) | 59 (79.7) | 0.01 | 0.912 |
| No | 30 (20.4) | 15 (20.5) | 15 (20.2) | 0.00 | 0.947 |
| **If yes, what? **** | | | | | |
| | N = 349 | N =172 | N=177 | | |
| Speech | 69 (19.8) | 34 (19.7) | 35 (19.8) | 0.02 | 0.896 |
| Eating | 74 (21.2) | 30 (17.4) | 44 (24.9) | 1.54 | 0.215 |
| Appearance | 90 (25.8) | 48 (27.9) | 42 (23.7) | 0.32 | 0.570 |
| Oral hygiene | 41 (11.7) | 21 (12.3) | 20 (11.3) | 0.00 | 0.945 |
| Self-esteem | 75 (21.5) | 39 (22.6) | 36 (20.3) | 0.09 | 0.764 |

** Multiple answers

**Table 4: Sources of respondents' knowledge of orthodontics.**

| Source of information | Dental (N) | % | Medical (N) | % | $X^2$ | P |
|---|---|---|---|---|---|---|
| Lectures/ Seminars | 25 | 36.76 | 7 | 19.44 | 1.30 | 0.26 |
| Radio/ TV | 3 | 4.41 | 2 | 5.56 | 0.05 | 0.57 |
| Magazines/ journals | 12 | 17.65 | 5 | 13.89 | 0.02 | 0.89 |
| General practitioner | 9 | 13.24 | 4 | 11.11 | 0.00 | 0.52 |
| Friends | 18 | 26.47 | 17 | 47.22 | 1.61 | 0.20 |
| Relatives | 1 | 1.47 | 1 | 2.78 | 0.09 | 0.58 |

**Figure 2: Respondents views on referral of patients to an orthodontist for treatment**




## Discussion

The purpose of this study was to assess the level of awareness and knowledge of orthodontics among medical and dental students in the University of Port Harcourt, Rivers State Nigeria. The knowledge and foundation laid during the undergraduate training in the medical school will go a long way to influence the practice of medicine, appropriate patient referrals, and even the decision to specialize or not.

In this present study, only 43.5% of respondents had ever visited a dentist before, majority of which (41%) was for scaling and polishing. This is quite poor, considering that respondents were aged from 18 -45 years. This is much lower than 73.8% reported from a similar study[14] on medical students in Saudi Arabia; an indication that awareness and utilization of dental services on the whole, not just orthodontics, is still quite low in Nigeria. Similar findings have been reported from studies[17, 18] on utilization of dental services in Nigeria. These studies reported 14.1% and 7.8% utilization of dental services respectively, by undergraduates within a 12 month period. A better understanding of the inter-relationship that exists between oral health and general health has now shown that low awareness and utilization of dental services can have direct negative impact on general health [19].

More than half of the respondents (60.5%) in this study were aware of the term "Orthodontics". Although higher than the 45.9%[13] and 50.1%[14] reported from similar studies, this proportion is still indicative of a sub-optimal knowledge and awareness of orthodontics. Dental students were however, significantly more aware of orthodontics as a specialty in dentistry, than their medical colleagues ($p = 0.029$). This was not surprising, as it is expected that dental students will be exposed to all aspects of dentistry, including orthodontics, though not in depth. However, about 20% of these dental students were not aware of orthodontics as a specialty. This percentage probably represents those in pre-clinical years of study, as 54.8% of the dental students in this study were pre-clinical. The curriculum in the pre-clinical years is usually same as for medical students, with the focus majorly on general health.

As regarding their source of information about orthodontics, majority (30% of combined sample) got their knowledge from their friends. However, among dental students alone, "lectures and seminars" was the commonest source of information, representing 53.2% of responses, while "Friends" was the commonest response (48.6%) among medical students. Although these differences were not statistically significant, it may be an indication that the curriculum for medical students is deficient in the area of orthodontics. This apparent deficiency in training has also been reported by Omitola and Arigbede[20]. Their findings revealed that 53.0% of medical house officers reported that they had only one week training and exposure to dentistry, while a few (3.6%) had only one day training as medical students. Thus as medical doctors, they may not be able to effectively identify and refer patients for orthodontic treatment [21].

On impacts of malocclusion on daily activities, appearance and mastication recorded highest number of responses. This is in agreement with previous studies[13,14], also involving medical students in Nigeria and in Saudi Arabia. Improved aesthetics has been reported to be a strong motivating factor influencing patient's desire for orthodontic treatment[22]. The society also places a high value on aesthetics, evidenced by the increasing numbers

of models and actors becoming role models for a lot of young people. Only a handful of respondents agreed that malocclusion can affect oral hygiene and almost a quarter of respondents stated that malocclusion has no impact on daily activities, including self-esteem. This perception of the impacts of malocclusion on daily living and overall quality of life is largely inaccurate, and might be the reason why a lot of orthodontic patients seen in Nigeria are self-referred despite having a personal / family physician.

In a study of family physicians in Lagos, 95.1% had been consulted for oral complaints during the course of their jobs but only about half of them (51.9%) had ever referred such patients to a dentist[19]. Similarly, from another study[23] on doctors at a HIV clinic, 75.6% had been consulted on dental issues, and 70% admitted that they had not referred the patients to a dentist. This pattern was also observed in this present study: a quarter of medical students (25.5%) stated that they would not refer patients with dental problems to a dentist, though majority agreed that patients with malocclusions should be referred to an orthodontist. This therefore emphasizes the need for proper and adequate awareness of orthodontics, as well as its impacts on overall quality of life among medical students.

## Conclusion

The knowledge of orthodontics as a specialty in dentistry, malocclusion, its impacts and benefits from treatment is very inadequate among these undergraduates in the College of Health Sciences, University of Port Harcourt. We recommend an introductory course in orthodontics be incorporated into the medical curriculum. This will definitely improve their ability to identify malocclusion, educate their patients and make appropriate referrals in future.

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