RESEARCH ARTICLE

Orthodontic awareness amongst middle school teachers and parents of twin cities

Asma Mansoor, Mishaal Arshad Kasana, Rozina Nazir, Tania Arshad Siddiqui, Saad Mansoor, Shoaib Rahim

Abstract

Objective: To compare the level of awareness towards orthodontic treatment among parents and teachers of middle school children.

Method: The cross-sectional study was conducted from July 2021 to May 2022 in the middle schools of Rawalpindi and Islamabad, Pakistan, after approval from the ethics review committee of the Foundation University College of Dentistry and Hospital, Foundation University, Islamabad. Those included were middle school teachers and parents of students studying in middle schools. Data was collected using a validated questionnaire that had 6 demographic and 5 survey questions. The form was digitized for easy dissemination among parents. Data was analysed using SPSS 23.

Results: Of the 240 subjects, 120(50%) each were parents and teachers. Overall, there were 165(68.75%) females and 75(31.25%) males. Level of education and professional exposure were not significantly different between teachers and parents ($p>0.05$). There was no difference in the level of education and professional work experience between the parents and teacher ($p>0.05$). Teachers showed a higher level of awareness than parents towards the role of orthodontist in tooth alignment ($p=0.013$), associated habits with malalignment of teeth ($p=0.003$), and that the most appropriate age for treatment was 10-15 years ($p\leq0.001$). Teachers were more likely of the opinion that facial disharmony is treatable than parents (odds ratio: 1.599, 95% confidence interval: 0.572-4.467).

Conclusion: Teachers showed a higher level of awareness than parents regarding orthodontic treatment of children.

Keywords: Awareness, Orthodontics, Middle school teachers, Parents, Attitude. (JPMA 74: 480; 2024)

DOI: https://doi.org/10.47391/JPMA.9223

Introduction

Orthodontics is a specialty of dentistry that addresses the diagnosis, prevention, correction of malocclusion, and modification of facial growth. Malocclusion affects quality of life, and studies have shown a positive correlation between oral health related quality of life (OHRQoL) and malocclusion.[1] Studies have found that Grade 4 Index of Orthodontic Treatment Need-Dental Health Component (IOTN-DHC) highly influences OHRQoL[2] and that patients who seek orthodontic treatment experience an improvement in overall quality of life.[3]

Children in middle school spend most of their time with teachers and parents, and orthodontic awareness among these groups can help in identifying developing malocclusions.[4] It has been shown that counselling by teachers for oral health promotion has a positive impact on behaviour of children.[5] This is important for middle school children as they are experiencing changes in their physical and biological self that impact their self-esteem.

Foundation University College of Dentistry and Hospital, Foundation University, Islamabad, Pakistan.

Correspondence: Tania Arshad Siddiqui. e-mail: taniasiddiqui@hotmail.com
ORCID ID. 0000-0003-4413-3895

Submission complete: 03-03-2023 **Review began:** 04-04-2023
Acceptance: 11-11-2023 **Review end:** 18-10-2023

The relationship between teachers and orthodontic awareness has been seldom investigated. Questionnaire-based studies conducted among teachers in Iran and southern India found that teachers believed that orthodontic treatment should commence at an early age.[4,6] According to Bhadauria et al.,[5] teachers were of the opinion that malocclusion affects a child's personality. After parents, teachers play an important role in shaping the personality of a child. Children in middle school are at an important stage of personality development through acceptance among their peers. Teachers play a crucial role at this stage as they are able to observe the acceptance of children among their peers. They can facilitate and help students by educating parents to seek treatment when needed.

The current study was planned to compare orthodontic awareness among middle school teachers and the parents of children studying in middle schools, and to correlate the level of awareness with their respective level of education.

Subjects and Methods

The analytical, cross-sectional study was conducted from July 2021 to May 2022 in the middle schools of Rawalpindi and Islamabad, Pakistan, after approval from the ethics review committee of the Foundation University College of Dentistry and Hospital, Foundation University, Islamabad.

Data was collected using a modified version of the questionnaire used earlier in a study.[4] The original questionnaire consisted of 17 questions divided into 3 sections, while the modified questionnaire contained 15 questions divided into 2 sections; 6 demographic questions and 9 survey questions related to orthodontic awareness. The demographic questions focused on the gender of the participants, occupation, education level, and work-related data. The survey questions assessed basic knowledge regarding orthodontics (Annexure 1). The questionnaire was validated for content by two dentists and one orthodontist. A pilot study with 30 participants was conducted for reliability of the questionnaire. Cronbach's alpha test was used. Item, scale and inter-item analysis using correlations were done to identify the best questions for the research tool. The Cronbach's alpha improved from 0.36 to 0.60. The final questionnaire consisted of 6 demographic and 5 survey questions. This was comparable to the original tool[4] which had Cronbach's alpha value 0.62.

Annexure 1

Survey Questionnaire

Demographics

1. Gender ☐ Female ☐ Male
2. Are you a parent or teacher? ☐ Parent ☐ Teacher
3. If you're a parent then what is your occupation?
   ☐ Government Employee ☐ Healthcare Professional ☐ Housewife
   ☐ Self Employed ☐ Private Job
4. If you are a teacher, you work in which sector? ☐ Public sector ☐ Private sector
5. Level of education. ☐ SSC ☐ HSSC ☐ Undergraduate
   ☐ Postgraduate ☐ Post-doctorate
6. Professional work experience. ☐ <5 years ☐ <10 years ☐ <20 years ☐ ≥20 years

Survey Questions

1. What do you think an Orthodontist does? ☐ Aligns teeth ☐ Does filling
   ☐ Does scaling and polishing ☐ Extracts teeth ☐ Make dentures
2. Do you think habits like nail-biting and thumb sucking can make your teeth malaligned? ☐ Yes ☐ No
3. According to you what is the most suitable age range for receiving orthodontic treatment? ☐ 10-15 years ☐ 15-20 years ☐ ≥20 ☐ ≥30
4. Do you think the malalignment of teeth can lead to any of these problems?
   ☐ Speech difficulty ☐ Difficulty while chewing ☐ Pain in the jaw
   ☐ Facial disharmony ☐ Psychological effects
5. Do you think facial disharmony is treatable? ☐ Yes ☐ No

Those included using convenience sampling technique were middle school teachers associated with grades 6-8 students and parents of children aged 9-13 years. Informed consent was obtained from all the participants. Those no willing to participate as well questionnaires with incomplete responses were excluded.

The sample size was calculated using the World Health Organisation (WHO) calculator[7] with confidence level 90% and absolute precision 10% in the light of literature. The sample was inflated by approximately 10% to account for response rate and dropouts.

Random schools from both private and public sectors were selected. School authorities were approached, and permission was obtained from the administration. The printed and online questionnaires were distributed to middle school teachers of the selected schools. They were asked to fill out the questionnaire themselves and distribute them amongst their students so that they may get them filled out by their parents. The forms had a set of instructions provided for the parents. The questionnaires were collected after 1 week from the teachers.

Data was analysed using SPSS 23. Differences in levels of education and work experience were compared using Mann-Whitney U test. Association, correlation, and level of agreement between the parents and teachers were assessed using chi-square test, Spearman Correlation Coefficient, and Cohen's Kappa coefficient. Multinomial regression analysis was done to determine the factors affecting the awareness level between the two groups, and odds ratio (OR) was determined with 95% confidence interval (CI). $P<0.05$ was taken as statistically significant.

Results

Of the 240 subjects, 120(50%) each were in the parent and teacher groups Overall there were 165(68.75%) females and 75(31.25%) males. Among the mothers, there were 37(53.6%) housewives, while among the fathers, 28(54.9%) were working in the private sector. The highest level of education among the males 40)53.3%) and females 82(49.7%) was postgraduate. The professional experience among the males exceeded 20 years in 44(59%) cases, while among the females it was ≤10 years in 42(25%) cases and ≤5 years in 39(24%) (Table 1). Level of education and professional exposure were not significantly different

Table-1: Descriptive data.

Variable	Level	**Female** n (%)	**Male** n (%)
Parents	Government Employee	4 (5.8)	13 (25.5)
	Healthcare professional	5 (7.2)	2 (3.9)
	Housewife	37 (53.6)	0(0)
	Self employed	10 (14.5)	8 (15.7)
	Private job	13 (18.8)	28 (54.9)
Teachers	Public Sector	47 (48.9)	13 (54.2)
	Private Sector	49 (51)	11 (45.8)
Level of education	SSC	37 (22.4)	2 (2.6)
	HSSC	7 (4.2)	2 (2.6)
	Graduate	38 (23)	28 (37.3)
	Post Graduate	82 (49.7)	40 (53.3)
	Post doctorate	1 (0.6)	3 (4)
Professional work experience	N/A	33 (20)	-(-)
	≤5 years	39 (24)	5 (7)
	≤10 years	42 (25)	14 (19)
	≤20 years	29 (18)	12 (16)
	≥20 years	22 (13)	44 (59)

SSC: Secondary school certificate, HSCC: Higher secondary school certificate. N-240 Cross tab

between teachers and parents (Table 2).

The response received from the parents and teachers as well as their correlation and level of agreement were worked out fro all the 5 survey questionnaires (Table 3).

Table-2: Comparison between parents and teachers regarding level of education and professional work experience.

Variable	**Parents** n (%)	**Teachers** n (%)	***p*-value**
Level of education			
SSC	10 (8.3)	29 (24.2)	0.480
HSSC	6 (5)	3 (2.5)	
Graduate/ Bachelors	51 (42.5)	15 (12.5)	
Post Graduate/ Masters	50 (41.6)	72 (60)	
Post doctorate	3 (2.5)	1 (0.8)	
Professional Work experience			
N/A	33 (27.5)	0(0)	0.799
≤ 5 years	11 (9.2)	33 (27.5)	
≤ 10 years	12 (10)	44 (36.6)	
≤ 20 years	21 (17.5)	20 (16.7)	
≥ 20 years	43 (35.8)	23 (19.2)	

SSC: Secondary school certificate, HSCC: Higher secondary school certificate. N- 240; Mann Whitney U Test; $p < 0.05$*.

Parents showed more awareness than teachers that "alignment of teeth" is performed by orthodontists (OR: 2.310, *p*=0.396) and that orthodontic treatment should be done at the age of ≥20 years (OR: 7.543, p=0.006). Teachers, however, had better awareness than parents that "facial disharmony is treatable" (Table 4)

Discussion

The current study suggests parents' contribution is the single most important factor in initiating orthodontic care. Earlier studies[8,9] found moderate level of awareness among parents for orthodontic treatment. Improvement in aesthetics was reported as the main reason for pursuing orthodontic treatment by parents (87.2%).[10]

Teachers have been shown to have an important role in oral health promotion. A study[11] proposed teachers as individuals influencing children in every aspect, including oral health maintenance. Fair knowledge among teachers has been reported related to oral hygiene practices[12] indicating that oral health maintenance should be a part of the curriculum in order to increase awareness among

Table-3: Association, correlation and agreement in terms of perception between parents and teachers regarding orthodontic treatment.

Variables		**Teacher** n (%)	**Parent** n (%)	***p*-value**	***r*-value**	***p*-value**	**k**	***p*-value**
What do you think an orthodontist does?	Aligns teeth	88(73.3)	69 (57.5)	0.013*	-0.14	0.037*	-0.09	0.007*
Do you think habits like thumb sucking and nail biting can make your teeth mal-aligned	Yes	73 (60.8)	49 (40.8)	0.003*	-0.2	0.002*	-0.2	0.002*
According to you what is the most suitable age range for receiving orthodontic treatment?	10-15 years	52 (43.3)	33 (27.5)	≤0.001***	-0.14	0.028*	-0.06	0.129
	15-20 years	36 (30)	36 (30)					
	≥20 years	15 (12.5)	46 (38.3)					
	≥30 years	17 (14.16)	5 (4.16)					
Do you think mal-alignment of teeth can lead to any of these problems?	Speech Difficulty	46 (38.3)	39 (32.5)	0.418	-0.06	0.347	-0.06	0.345
	Difficulty while chewing	44 (36.67)	63 (52.5)	0.019*	0.159	0.013*	0.158	0.014*
	Pain in jaw	36 (30)	67 (55.8)	≤0.001***	0.261	≤0.001***	0.258	≤0.001***
	Facial Disharmony	53 (44.2)	53 (44.2)	1.00	0.00	1.00	0.00	1.00
	Psychological Effects	25 (20.8)	39 (32.5)	0.042*	0.135	0.037*	0.12	0.037*
Do you think facial disharmony is treatable?	Yes	107 (89.2)	87 (72.5)	0.002*	-0.21	0.001**	-0.17	0.001**

N- 240; ǂ Chi square test; † Spearman Correlation Coefficient; ‡ Cohen's Kappa ; *p*- value< 0.05*, *p*- value ≤ 0.001**, *p*- value < 0.001 ***

Table-4: Multinomial logistic regression analysis for factors associated with the level of awareness of teachers and parents.

Variables		**Teachers**		***p*-value**	**Parents**		***p*-value**
		OR	**95% CI**		**OR**	**95% CI**	
What do you think an orthodontist does?	Aligns teeth	0.433	0.064, 2.996	0.154	2.310	0.334, 15.982	0.396
Do you think habits like thumb sucking and nail biting can make your teeth mal-aligned	Yes	0.967	0.870, 3.010	0.128	1.034	0.490, 2.181	0.930\
According to you what is the most suitable age range for receiving an orthodontic treatment?	10-15 years	0.446	0.104, 1.315	0.124	2.242	0.511, 9.831	0.284
	15-20 years	0.411	0.087, 0.968	0.044*	2.434	0.596, 9.931	0.215
	≥ 20 years	0.133	0.032, 0.392	0.001**	7.543	1.778, 31.999	0.006*
Do you think mal-alignment of teeth can lead to any of these problems?	Speech Difficulty	1.403	0.658, 2.993	0.264	0.713	0.334, 1.520	0.381
	Difficulty while chewing	0.766	0.376, 1.561	0.098	1.305	0.641, 2.657	0.464
	Pain in jaw	0.492	0.191, 0.671	0.001**	2.032	0.953, 4.333	0.067
	Facial Disharmony	0.639	0.372, 1.298	0.254	1.564	0.758, 3.224	0.226
	Psychological Effects	0.638	0.337, 1.338	0.258	1.567	0.704, 3.488	0.272
Do you think facial disharmony is treatable?	Yes	1.599	0.809, 5.046	0.132	0.625	0.224, 1.748	0.371

OR: Odds ratio, CI: Confidence interval. n=240; Multinomial Logistic Regression Analysis; p-value ≤ 0.05*, p-value ≤0.001**, p-value < 0.001***

students.

There was a lack of studies assessing baseline orthodontic and oral health knowledge levels between parents and teachers simultaneously. The current study tried to fill the gap in literature, suggesting that a collaborative approach involving parents and teachers can be used for timely orthodontic care to prevent the onset of malocclusion. Delays in orthodontic treatment can lead to severe skeletal discrepancies with limited or no treatment options.

Aldweesh et al.[3] found that 79% parents expressed more orthodontic concern for their children as they believed it affected their personality. Other factors included the educational level of parents, and parents with a history of orthodontic treatment.[13] A cross-sectional study in Iran assessed parental knowledge and attitude toward early orthodontic treatment for their primary school children, and showed that highly educated parents had a considerably better attitude and higher level of knowledge.[14]

Similarly, education level may lead to differences in the experience, and knowledge of the teachers.[11] The current results negated the correlation between education and the extent of awareness because there was no significant difference between teachers and parents regarding their level of education and professional experience.

The aetiology of malocclusion is influenced by several genetic and environmental conditions, including dietary consistency, tongue thrusting, and thumb-sucking which negatively contribute to dental arch dimensions.[15] Teachers' and parents' knowledge regarding the implications of para-functional habits and their critical role in increasing awareness among children and adolescents can prevent malocclusion onset at the earliest age. In the current study, teachers were less likely than parents to have knowledge of the impact of para-functional habits on teeth malalignment.

The present study observed that 43.3% of the teachers thought that treatment should commence at age 10-15 years, unlike 27.5% of the parents. A research[4] found that 52.8% of the teachers believed that treatment should commence at an early age as it reduces the treatment time and severity of the malocclusion. This is significant as delayed treatment can lead to deterioration of oral-tooth health and malocclusion.[16]

Tabbaa et al.[17] found that parents were of the opinion that orthodontic treatment can commence at any age, but in the current study, parents were 7 times more likely to be of the opinion that treatment should start at age 20 years and above.

The current study has its limitations. It was conducted in the twin cities of Pakistan, and the findings cannot be generalised to the whole population. The forms to be filled by the parents were taken home by the students. Although they were instructed to fill the forms independently, there was no method to ascertain if the instructions had been followed.

Conclusions

There was a discrepancy in the knowledge of orthodontic treatment between parents and teachers. Although the parents showed more awareness of the impact of orthodontic treatment, this was not statistically significant when compared to the teachers. Parents were more likely of the opinion that treatment should start after the age of 20 years. This is a cause of concern as delayed treatment of certain conditions may not always produce the desirable outcome.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

References

1. Ajwa N, AlHammad A, AlAmmar L, AlMarjan M, AlShugair T, AlManie L, et al. The Influence of Orthodontic Treatment Need on Oral Health-Related Quality of Life among 12-18-Year-Old Adolescents in Riyadh. Healthcare (Basel) 2022;10:2153. doi: 10.3390/healthcare10112153.
2. Baidas LF, AlJunaydil N, Demyati M, Sheryei RA. Fixed orthodontic appliance impact on oral health-related quality of life during initial stages of treatment. Niger J Clin Pract 2020;23:1207-14. doi: 10.4103/njcp.njcp_681_19.
3. Jaeken K, Cadenas de Llano-Pérula M, Lemiere J, Verdonck A, Fieuws S, Willems G. Reported changes in oral health-related quality of life in children and adolescents before, during, and after orthodontic treatment: a longitudinal study. Eur J Orthod 2019;41:125-32. doi: 10.1093/ejo/cjy035.
4. Rafighi A, Foroughi Moghaddam S, Alizadeh M, Sharifzadeh H. Awareness of Orthodontic Treatments among School Teachers of Two Cities in Iran. J Dent Res Dent Clin Dent Prospects 2012;6:25-8. doi: 10.5681/joddd.2012.006.
5. Bhadauria US, Mathur RV, Agarwal A, Shukla R, Godha S, Maheshwari R. Impact of counseling and reinforcement by school teachers on behavior change in children: A one -year follow-up study. J Educ Health Promot 2020;9:e129. doi: 10.4103/jehp.jehp_84_20.
6. Mhatre AH, Mane P, Mathew KR, Ganigar CR, Pawar R, Phaphe S, et al. Awareness of orthodontic treatment among school teachers in Karad Taluka. Indian J Dent Res 2019;30:363-7. doi: 10.4103/ijdr.IJDR_631_17.
7. Lwanga SK, Lemeshow S. Sample size determination in health studies: a practical manual. Geneva, Switzerland: World Health Organization; ⊠1991⊠. [Online] 1991 [Cited 2023 November 11]. Available from URL: https://apps.who.int/iris/handle/10665/40062
8. Alsaggaf DH, Alqarni MZ, Barayan SA, Assaggaf AA, Alansari RA. Parents' Awareness of Malocclusion and Orthodontic Consultation for Their Children: A Cross-Sectional Study. Children (Basel) 2022;9:1974. doi: 10.3390/children9121974.

9. Alnaafa M, Altamimi Y, Alajlan S, Alateeq N, Almarshedi A, Alsaleh M, et al. The parental awareness regarding early orthodontic treatment in Hail city. Int. Med. J 2020;27:220-3.
10. Felemban OM, Alharabi NT, A Alamoudi RA, Alturki GA, Helal NM. Factors influencing the desire for orthodontic treatment among patients and parents in Saudi Arabia: A cross-sectional study. J Orthod Sci 2022;11:e25. doi: 10.4103/jos.jos_181_21.
11. Singh H, Chaudhary S, Gupta A, Bhatta A. Oral Health Knowledge, Attitude, and Practices among School Teachers in Chitwan District, Nepal. Int J Dent 2021;2021:e9961308. doi: 10.1155/2021/9961308.
12. Alshemari MA, Alkandari SA. Oral Health Knowledge and Attitudes Towards Oral Health Education Among Elementary School Teachers in Kuwait. Oral Health Prev Dent 2021;19:595-602. doi: 10.3290/j.ohpd.b2259111.
13. Aldweesh AH, Ben Gassem AA, AlShehri BM, AlTowaijri AA, Albarakati SF. Parents' Awareness of Early Orthodontic Consultation: A Cross-Sectional Study. Int J Environ Res Public Health 2022;19:1800. doi: 10.3390/ijerph19031800.
14. Moshkelgosha V, Kazemi M, Pakshir H, Safari R. Parental knowledge and attitude towards early orthodontic treatment for their primary school children. Iran J Ortho 2017;12:1-7. doi: 10.5812/ijo.7377.
15. Lombardo G, Vena F, Negri P, Pagano S, Barilotti C, Paglia L, et al. Worldwide prevalence of malocclusion in the different stages of dentition: A systematic review and meta-analysis. Eur J Paediatr Dent 2020;21:115-22. doi: 10.23804/ejpd.2020.21.02.05.
16. Ciğerim SC, Erhamza TS. Evaluation of awareness and knowledge of orthodontic treatment among primary and secondary school students: A cross-sectional epidemiological school study. APOS Trends Orthod 2021;11:140-7. Doi: 10.25259/apos_185_2020.
17. Tabbaa MY, Albarkheel AR, Al Mubarak S. Parents' Knowledge and Awareness of Orthodontics and Orthodontic Treatment in Saudi Arabia. Int J Sci Res 2020;9:599–604. DOI: 10.21275/SR201209015003.

Author Contribution:
AM, MAK: Conceptualization, investigation, resources, writing , original draft preparation
AM and TAS: Methodology
TAS: Software, Project administration
AM, MAK, TAS and RN: Validation
TAS: Formal analysis
TAS and SM: Data curation
RN and SR: Writing, review and editing
AM: Visualization
RN: Supervision