Prevalence of Orthodontic Treatments Among Dental Students

OKU Sutro Excellence Day 2021

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Introduction

Single Phase and Two-Phase orthodontic treatment timelines have been utilized by orthodontists based on the needs and treatment of the patient.

In two-phase treatment, first phase appliances are meant to correct skeletal and neuromuscular discrepancies while second phase therapy accomplishes occlusion and esthetics corrections (1,2)

Some advocates of a one phase approach argue that 90% of growing patients can be treated successfully in late mixed dentition in only one phase (1)

Retainers have been vital in retaining orthodontic corrections.

The aim of the research was to evaluate the prevalence of orthodontic treatments including one-phase vs. two-phase orthodontic treatment and the use of different retainers among dental students at Dugoni.

1. Suresh, M., Ratnaditya, A., Kattimani, V. S., & Karpe, S. (2015). One Phase versus Two Phase Treatment in Mixed Dentition: A Critical Review. Journal of international oral health : JIOH, 7(8), 144–147. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4588783/
2. Graber LW, Vanarsdall RL, Vig KWL, Huang GJ. Orthodontics - E-Book : Current Principles and Techniques. Vol Sixth edition. St. Louis, Missouri: Mosby; 2017.

Population, Methods, Data Collection

Qualtrics Pacific was used to create and send a questionnaire to dental students here at University of the Pacific, Arthur A. Dugoni School of Dentistry.

The study received 130 valid responses from the students regarding their demographic background and orthodontic treatment history.

The study analyzed the effects of sex and race on history of orthodontic treatment, location of treatment, presence of malocclusion, presence of short roots, timeline of orthodontic treatment, age of first orthodontic treatment, type of orthodontic treatment, and history of retainer usage.

Statistical analyses were performed with appropriate tests and crosstabs.

Results & Analysis

	Sex	Race
Urban Setting	Pearson's Chi Square	Fisher's Exact Test Freeman Halton extension
Malocclusion	Pearson's Chi Square	Pearson's
Short Roots	Pearson's Chi Square	Fisher's Exact Test Freeman Halton extension
Orthodontic Timeline	Pearson's Chi Square	Fisher's Exact Test Freeman Halton extension
Age of First Orthodontic Treatment	t-test	ANOVA
Type of Orthodontic Treatment	Cochrane's Q with McNemar	Cochrane's Q with McNemar
Retainer Used Y/N	Pearson's Chi Square	Fisher's Exact Test Freeman Halton extension
Retainer Phase	Pearson's Chi Square	Pearson's Chi Square

Age Distribution by Sex and Race Among Participants
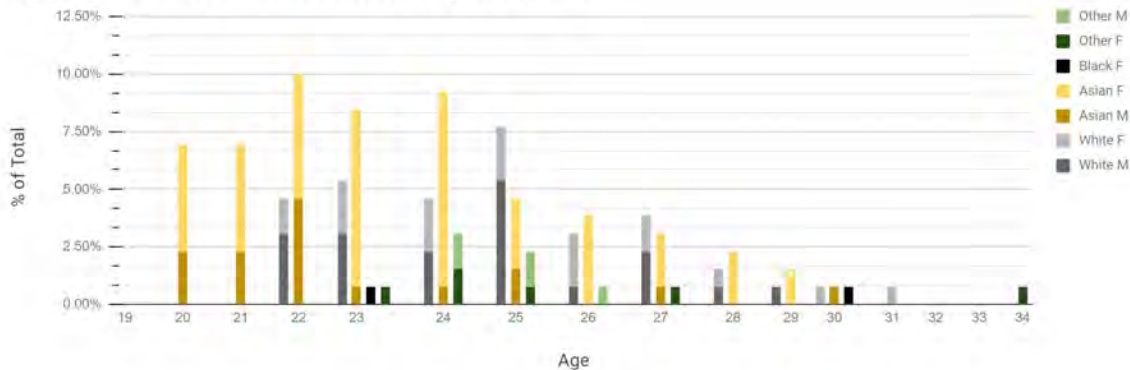
Categorical Variable	Male Percentage (n=48)	Female Percentage (n=82)	Categorical Variable	White Percentage (n=43)	Asian Percentage (n=74)	Other Minority Percentage (n=13)
Race						
White	50	23.17	Female	55.81	75.68	53.85
Asian	37.5	68.29				
Other Minority	12.5	8.54	Continuous Variables	White Percentage (n=43)	Asian Percentage (n=74)	Other Minority Percentage (n=13)
Continuous Variables	Mean (SD)	Mean (SD)				
Age	24.10 (2.75)	24.21 (2.50)	Age	24.93 (2.21)	23.46 (2.47)	25.69 (3.12)

Results

Demographic Characteristics of the Sample and Outcomes by Sex (N=130)

Categorical Variable	Male Percentage (n=48)	Female Percentage (n=82)	P-value
Urban Setting	79.17	91.46	0.045
Malocclusion	52.08	59.76	0.394
Short Roots	0	12.20	0.012
Orthodontic Tx	93.75	93.90	0.64

Categorical Variable	Male Percentage (n=44)	Female Percentage (n=79)	P-value
Orthodontic Timeline			<0.001
Single Phase	54.54	64.55	
Two Phase	38.63	26.58	
Other	6.81	8.86	
Orthodontic Treatments			
Braces	33.6	34.72	<0.001
Fixed/Removable Space Maintainers	8.80	5.18	<0.001
Aligners	7.20	11.92	
Headgear	4.80	5.18	
Palatal Expander	8.80	4.15	
Retainers	30.40	33.16	
Splints/Jaw Repositioning Appliances	4.00	3.63	
Other	2.40	2.07	

Categorical Variable	Male Percentage (n=44)	Female Percentage (n=79)	P-value
Retainer Used	91.67	86.59	0.382
Retainer Timeline			0.328
After Single-Phase	51.06	64.20	
After First Phase	14.89	12.35	
After Second Phase	34.04	23.46	

Continuous Variables	Mean (SD)	Mean (SD)	P-value
Age of First Orthodontic Treatment	12.47 (3.78)	13.01 (4.71)	0.484

Demographic Characteristics of the Sample and Outcomes by Race (N=130)

Categorical Variable	White Percentage (n=43)	Asian Minority (n=74) Percentage	Other Minority Percentage (n=13)	P-value
Urban Setting	65.9	98.65	91.89	0
Malocclusion	58.13	56.76	53.85	0.961
Short Roots	0	12.16	7.70	0.039
Orthodontic Tx	95.35	91.89	100	1

Categorical Variable	White Percentage (n=40)	Asian Minority (n=70) Percentage	Other Minority Percentage (n=13)	P-value
Orthodontic Timeline				0.323
Single Phase	55.00	64.28	61.54	
Two Phase	37.50	25.71	38.46	
Other	7.50	10.00	0	
Orthodontic Treatments				
Braces	33.6	39.47	27.5	<0.001
Fixed/Removable Space Maintainers	9.30	4.61	5.00	<0.001
Aligners	10.6	9.87	12.5	
Headgear	11.62	4.61	10.00	
Palatal Expander	11.62	3.95	7.50	
Retainers	31.86	34.87	32.50	
Splints or Jaw Repositioning Appliances	18.60	1.97	2.50	
Other	11.63	0.66	2.50	

Categorical Variable	White Percentage (n=40)	Asian Minority (n=70) Percentage	Other Minority Percentage (n=13)	P-value
Retainer Used	93.02	83.78	100	0.165
Retainer Timeline	n=40	n=62	n=13	0.290
After Single-Phase		14.71	12.50	
After First Phase		19.12	37.50	
After Second Phase		66.18	50.00	

| Continuous Variables	White Percentage (n=43)	Asian Percentage (n=74)	Other Minority Percentage (n=13)	P-value
Age of First Orthodontic Treatment	11.88 (11.51)	13.59 (23.35)	11.69 (17.23)	0.088

Discussion

Effects of Sex
- Women on average were more likely than men to receive their orthodontic treatment from a clinic in an urban setting, X2(1, N=130) = 4.03, p <0.05.
- Women were more likely than men to have short roots, X2(1, N=130) = 6.34, p <0.05

Distribution of Short Roots by Sex and Race
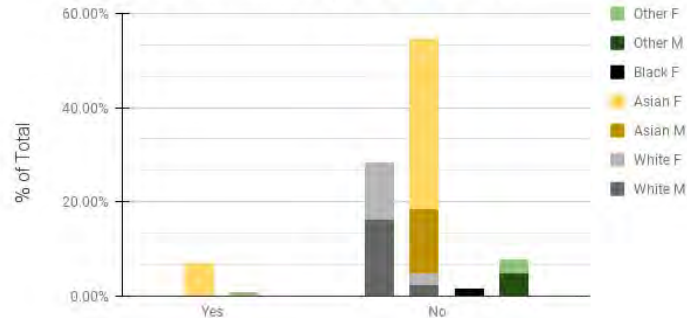
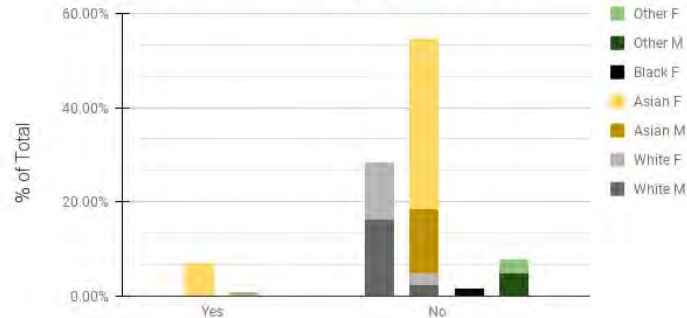Distribution of Malocclusion by Sex and Race
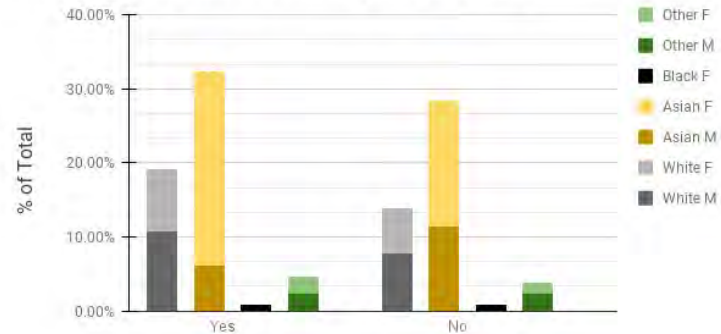
Discussion

Effects of Sex
- Women were more likely than men to undergo single phase treatment, $X2(2, N=127) = 4.03$, p <0.05
- Both men and women showed no significant differences in prevalence of malocclusion, retainer usage, retainer timeline, and age of first orthodontic treatment.
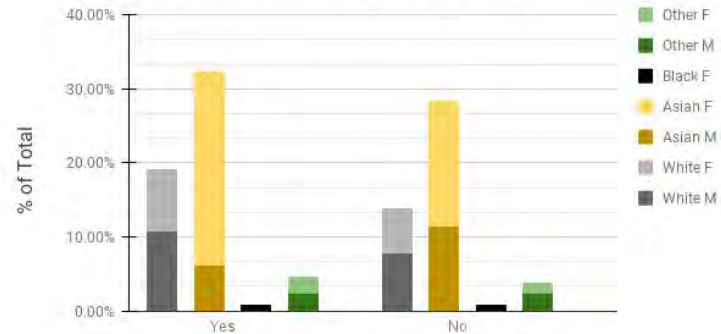
Discussion

Effects of Race
- Asians were more likely to receive orthodontic treatment in an urban setting, p<0.01
- Asians were more likely to have short roots, p <0.05, than individuals of other races
- All races showed no significant differences malocclusion, presence of orthodontic treatment, orthodontic timeline, retainer usage, retainer timeline, and age of first orthodontic treatment

Distribution of Short Roots by Sex and Race
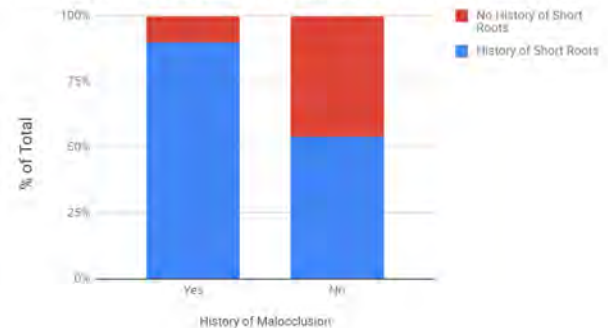

Distribution of Malocclusion by Sex and Race

Discussion

Other
- Braces and retainers were the most widely used orthodontic treatment regardless of gender and race, P<0.01.
- Weak association between short roots and malocclusion is present (p<0.05, Cramer V = 0.27). 90% of participants with short roots also had malocclusion while only 12.1% of participants with malocclusion had short roots.

Self Reported Prevalence of Malocclusion and Short Roots

Conclusions

Of dental students here at Dugoni, Women and Asians were more likely to experience short roots and complete orthodontic treatment in an urban setting as opposed to a rural setting. Women also were more likely to undergo Single-Phase treatment for orthodontic treatment.

Regardless of gender and race, braces and retainers were the most widely used orthodontic treatment.

Further Analysis

	Sex	Race	Age
Urban Setting	Pearson's	Fisher's Exact Test Freeman Halton extension	Pearson's
Malocclusion	Pearson's	Pearson's	Pearson's
Short Roots	Pearson's	Fisher's Exact Test Freeman Halton extension	Pearson's
Orthodontic Timeline	Pearson's	Fisher's Exact Test Freeman Halton extension	ANOVA
Age of First Orthodontic Treatment	t-test	ANOVA	Regression
Type of Orthodontic Treatment	Cochrane's Q	Cochrane's Q	Cochrane's Q
Retainer Used Y/N	Pearson's	Fisher's Exact Test Freeman Halton extension	t-test
Retainer Phase	Pearson	Pearson	ANOVA
Retainer Usage Length	Pearson's	Pearson's	Pearson's
Retainer Loss	Pearson's	Pearson's	Pearson's
Relapse Occurence	Pearson's	Pearson's	Pearson's

Acknowledgements

I would like to thank the students who participated in the study.