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Sociodemographic Characteristics of Orthodontic Patients in Association with Diagnosis, Adherence and Treatment Duration in Lugalo Military Hospital, Dar Es Salaam Tanzania

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Abstract

Background: Lugalo Military Hospital is a government hospital owned by the Ministry of Defense and National Service. This facility in Dar es Salaam Tanzania, started offering Orthodontic treatment in 2013. Little is known on the sociodemographic characteristics of the patients attended by an Orthodontist in this hospital. The prospective study was conducted to assess sociodemographic characteristics of orthodontic patients in association with diagnosis, adherence, and duration of treatment.

Methods: Seventy nine (79) orthodontic patients (44 females, 35 males), aged 7-42 years, were followed for treatment in a single stage with fixed appliances from November 2015 to December 2019. Sociodemographic data (age, sex, level of education) was collected from the treatment records. Analysis was conducted in association with diagnosis, type of orthodontic treatment, duration, and adherence.

Results: About 73% of all patients attended were orthodontic class I, median age for class I,II, III, were 14,15,and 13.5 years respectively. About 56% were females with median age of 14 years. Majority of patients (44%) had secondary education. About 67% of all the patients had poor adherence to treatment, among them 51% were males. Among all patients with good adherence, 50% had secondary level of education. Age groups of 11-14 and 15-19 years had majority of patients who completed treatment each had 8 patients equivalent to 38.1% respectively. Among all completed treatment 57.1% were females and secondary education level 47.6% was high among all patients who completed treatment. Treatment duration ranged from 3-43 months, the median duration of treatment was 14 months, ranged from 14 in class I to 23 in class II orthodontic patients.

Conclusion: The study showed the variations in the sociodemographic characteristics among patients helps in the planning of orthodontic services. However, some factors associated with poor utilization of orthodontic services could not be ascertained hence need future study.

Keywords: Orthodontic Treatment; Malocclusion; Sociodemographic Characteristics; Orthodontic Diagnosis

Introduction

Orthodontic treatment is the treatment of choice for the correction of malocclusions and improvement of facial esthetics. With socio-economic development, orthodontic treatment has become a common clinical procedure. There has been increased awareness to seek orthodontic treatment [1,2]. Motivation behind being aesthetic, psychosocial, economic and ethnicity reasons [1,3].

Different sociodemographic factors have been used in different studies to accomplish their objectives including age, sex, education, religion, residence, income, and race [1,2,4-7]. Some studies included only adults [1,4,5,8,9,10] while others included young children, adolescent children, and adults [2,3,11-18]. However studies which included young children, adolescent and adults more adolescents were observed than adults [13]. Furthermore, some studies also considered the education levels of involved patients including primary, secondary and college [1,14,16,19,20-24]. However, more patients with secondary education were involved than the rest. [22] While others included more college patients than the rest [16,23]. Demographic characteristics showed significant differences except for age and sex [1]. A significant association was observed between sex and the attitude that the treatment will make them more beautiful. While in other studies there was no statistically significant differences of dentofacial characteristics found among males and females [17,25].

Study done by George R, *et al.* did not find any significant association in orthodontic treatment needs in relation to age groups, gender, ethnicities, and education level [14]. However, in some studies showed more females observed to seek treatment than males [1-4,6,7,11,12,14-19,23,26-28]. While in other studies more males seek treatment than females [6,13,29].

Inclusion of confounders such as level of education of patients and their parents and occupation, age, and sex caused no significant change in the association of malocclusion severity and quality of life [15]. On examination patients were found to have different orthodontic diagnosis including facial profiles of straight, convex, and concave. Also, severe malocclusion, mild and borderline malocclusion together with class I II III on which each required different treatment orthodontic modalities [3,4,10,12,17,29].

Some studies showed Class I pattern to be most common followed by class II then class III [10,18,25,28,30]. While others showed class II [8,17] to be more common and others class III to be common [12,27].

Orthodontic treatment time has been influenced by a number of patient characteristics and clinical decisions. And has been found possible to predict estimated treatment time for a patient by using a small number of personal characteristics and treatment decisions. It was also found that male sex, maxillary crowding of 3mm or more, and a Class II molar relationship all predicted longer treatment times. Treatment time was further prolonged when extractions or bracket repositioning were required, or patient cooperation was poor [26].

The median duration of orthodontic treatment was 2.2 years [27]. There have been many studies conducted to determine demographic characteristics in relation to different variables including attitude towards treatment, motivation, self-perception in many different races [1,4,5,10,29].

Analysis of demographic characteristics in association to diagnosis, compliance and treatment duration is an essential tool in orthodontic evaluation and clinical treatment, where it provides information that enables formulate plans for orthodontic services. However, no enough information available locally to assess demographic characteristics of orthodontic patients attended in association to diagnosis, adherence, and treatment duration. Therefore, the aim of this study is to assess demographic characteristics of orthodontic patients attended in association to diagnosis, compliance, and treatment duration at Lugalo Military Hospital in Dar es salaam Tanzania. This study will help to formulate appropriate treatment plans and resources needed to support orthodontic services.

Methodology

Data of 79 patients aged 7-42 years were collected prospectively through patients attended at dental orthodontic department at Lugalo Hospital during 4 years from November 2015 to December 2019. Patients were initially recorded at outpatient department (OPD) and then referred to orthodontic department for further investigation, treatment and follow up. Data was collected from patients' files, recorded in the prepared excel sheet and analysis were conducted using excel for proportions, median, range for measured parameters such as age, sex, level of education, orthodontic classification, treatment adherence and treatment completion.

Results

Table 1: Orthodontic Classification by Sex

	Class			*Total*
Sex	I	II	III	
M	28	7	0	35
F	30	12	2	44
Total	**58**	**19**	**2**	**79**

Majority of patients attended orthodontic clinic were class I (73.4%) while class II and III were 24.1% and .2.5% orthodontic cases respectively

Table 2: Orthodontic Classification by Age

		Class		*Total*
(Age(years	I	II	III	
7>	1	0	0	1
8-10	8	1	0	9
11-14	24	12	2	38
15-19	14	6	0	20
20-24	5	0	0	5
25+	6	0	0	6
Total	**58**	**19**	**2**	**79**

Median ages for class I, II and III for attended orthodontic patients were 14,15 and 13.5 years respectively.

Table 3: Orthodontic Patients by Age and Sex

Age	**M**	**F**	**Total**
0-7	1	0	1
8-10	5	4	9
11-14	18	20	38
15-19	8	12	20
20-24	0	5	5
25+	3	3	6
Total	35	44	79

Among patients attended the clinic, 55.6% (44) were females. About half of the patients attended during the reported period were of the age between 11-14 years (48.1%) followed by age between 15-19 (25.3%). The patients age ranges between 7- 42 years with the median age of 14 years.

Table 4: Orthodontic Patients by Level of Education

Level of education	**Patients**	%
Primary	34	43
Secondary	35	44
College	10	13
Total	**79**	**100**

Among patients attended the clinic, majority 44% (35) had secondary level education, followed by 43% (34) primary education while 13% had college education.

Table 5: Adherence to Orthodontic Treatment by Age

		Adherence	
(Age(Years	***Good***	***Poor***	***Total***
0-7	0	1	1
8-10	3	6	9
11-14	14	24	38
15-19	4	16	20
20-24	3	2	5
25+	2	4	6
Total	**26**	**53**	**79**

Among all patients treated for Orthodontic, 26 (33%) had shown a good adherence to the treatment as compared to 53 (67%) with poor adherence.

Table 6: Adherence to Treatment by Sex

	Adherence to Treatment		
Sex	***Good***	***Poor***	***Total***
Male	8	27	35
Female	18	26	44
Total	**26**	**53**	**79**

Of all the patients who had good adherence to treatment, 31% (8) were males while for those with poor adherence 51% were males.

Table 7: Adherence to Treatment by Level of Education

Level of Education	***Adherence to Treatment***		
	Good	***Poor***	***Total***
Primary	9	25	34
Secondary	13	22	35
College	4	6	10
Total	**26**	**53**	**79**

Of all the patients with good adherence, majority (13) 50% had secondary education, while of all patients with poor adherence majority(25) 47% had primary education.

Table 8: Completed Treatment by Age

(Age(Years	***Completed Treatment***	%
0-7	0	0
8-10	2	9.5
11-14	8	38.1
15-19	**8**	**38.1**
20-24	**1**	**4.8**
25+	**2**	**9.5**
Total	**21**	**100**

Patients who had completed treatment were in the age group of 11-14 and 15-19 years followed by the age of 25 years and above.

Table 9: Completed Orthodontic Treatment by Sex

Sex	***Completed Treatment***	%
M	9	42.9
F	12	57.1
Total	21	100

Among all who completed treatment, 57.1% were females

Table 10: Completed Orthodontic Treatment by Level of Education

Level of Education	**Completed Treatment**	%
Primary	8	38.1
Secondary	10	47.6
College	3	14.3
Total	**21**	**100**

Majority of patients who completed treatment had secondary level education (47.6%).

Table 11: Duration of Completed Treatment and Classification of Orthodontic

Months				
	Class I	***Class II***	***Class III***	***Total***
3	1	0	0	1
7	1	0	0	1
8	1	0	0	1
9	0	1	0	1
10	2	0	0	2
12	1	0	1	2
13	2	0	0	2
14	1	0	0	1
16	2	1	0	3
20	0	1	0	1
21	1	1	0	2
24	2	0	0	2
30	0	1	0	1
43	0	1	0	1
Total	**14**	**6**	**1**	**21**

The duration of treatment among 21 patients who completed the treatment ranged between 3-43 months, the median duration of treatment is 14 months. Average duration of treatment for Class I and Class II Orthodontic cases are 14 and 23 months respectively.

Discussion

Majority of patients attended orthodontic clinic were class I (73.4%) followed by class II (24.1%) and III. These results correspond with results of other studies which showed Class I pattern to be the most common followed by class II then class III [10,18,25,28,30].

Median ages for class I, II and III for attended orthodontic patients were 14,15 and 13.5 years respectively. This shows that more adolescents were attended than young children and adults. This corresponds with other studies which included young children, adolescent children, and adults [10,11-18,29], of which more adolescents were observed than children and adults [10]. Probably due to the right time for orthodontic treatment which is advised to start between 11 and 15 years when all permanent teeth have already erupted.

Among patients attended the clinic, more females 55.6% (44) than others, corresponds with other studies where more females sought treatment than males [1-4,7,19,11,12,14,16-18,21,23,26-28]. This can be because females are more dissatisfied with their teeth than males and also females tends to be unhappy with their teeth than men [20]. However, females were more interested seeking orthodontic treatment which may be due to social acceptability and importance of aesthetic. Also, it seems that that parents are more interested in seeking orthodontic treatment for their female children than male children [15].

Among patients attended the clinic, majority 44% (35) had secondary level education, followed by 43% (34) primary education while 13% had college education. This corresponds with other studies in which more patients with secondary education were involved than the rest [22]. This could be because most of children around age 13 have already gone to secondary school of which majority were in this study.

Among all patients treated for Orthodontic, 26 (33%) had shown a good adherence to the treatment as compared to 53 (67%) with poor adherence. This could be due to forgetfulness of appointment and inability to get time off from work/school [21].

Of all the patients who had good adherence to treatment, 31% (8) were males while for those with poor adherence 51% were males. This could be due to the reason that males have less self-conscious and awareness and adherence than females. But some studies showed no differences in missed appointments between both genders and different age groups [21].

Of all the patients with good adherence, majority 50% had secondary education, while of all patients with poor adherence majority 47% had primary education. This could be due to the fact that self-conscious, awareness and self-esteem increase with education level [14].

Patients who had completed treatment were in the age group of 11-14 and 15-19 years followed by the age of 25 years and above. This could be due to the fact that adolescents are at the growth peak and for fast speed of treatment compared to adults. Other studies showed mean age of completed cases to be 10.4 to 19.9 months [26].

Among all who completed treatment, 57.1% were females. This could be due to the fact that majority of patients attended were females also self-awareness and adherence of females. This corresponds with other studies in which females completed treatment earlier than males [26].

Majority of patients who completed treatment had secondary level education (47.6%). This is because majority of completed cases are between age 11-14 and by this age majority have joined secondary education.

The duration of treatment among 21 patients who completed the treatment ranged between 3-43 months, the median duration of treatment is 14 months. Average duration of treatment for Class I and Class II Orthodontic cases are 14 and 23 months respectively. Treatment experience and treatment techniques could be the factors affected the duration, severity, and compliance. This corresponds with other studies in which treatment duration was 24.0 $\pm$11.2months and 1.6 years in non-extraction and 2.2 years in extraction cases [27,31].

Conclusion

Patients attended for orthodontic treatment were mostly adolescents, with secondary level education and had high prevalence of class I molar relationship. Female patients obtained orthodontic treatment than male ones. Most patients attended especially male had poor adherence to treatment. Overall treatment duration was between 14 and 23 months.

However, a small sample size in this study might have influenced the study results. Hence, the results cannot be generalized to the whole population for which further studies are recommended taking larger samples with other dental clinics and hospitals where comparison between patients undergoing orthodontic treatment and random group can also be done.

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