

Dental treatment needs among patients undergoing screening at a university-based dental institution in Kuantan, Pahang, Malaysia

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Abstract

University-based dental institution in Malaysia receives large number of dental visits, however, dental treatment needs among patients attending this kind of institution is not usually reported. This study aimed to identify the trend of dental treatment needs in a university-based dental institution in Kuantan, Pahang situated in the East Coast region of Peninsular Malaysia. This cross-sectional study utilized secondary data, obtained from list of patients who underwent for screening at Outpatient Clinic, Kulliyah of Dentistry, International Islamic University Malaysia from 1st January to 31st December 2016. Patient's age, gender, residential area and dental treatment needs were retrieved from the list. All patients were included except those with incomplete data, with old Malaysian identification card or foreign passport or those assigned to receive Orthodontic treatment. Descriptive statistics and Pearson's Chi Square test was run using SPSS[®] Version 20 software. Conservative care (22.7 %) was the major treatment need among 2,627 patients included in this study. Teenage and adult patients mostly required conservative care while the elder-aged patients have major need for prosthodontics. Females outnumbered males in requiring all types of dental treatment, except for conservative care which was pre-dominantly required by males. Patients residing non-urban area majorly required all types of dental treatment except for endodontics and conservative care which were more frequently necessitated by patients from urban area. Conservative care was the major dental treatment need. The type of dental treatment needs has significant association with patient's age, gender and residential area.

Keywords: treatment need, screening, dental, age, gender

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Introduction

Need is classified into normative, felt, expressed or comparative needs according to Bradshaw (1972) taxonomy.

Normative need for dental treatment is a category of need which is usually defined by the experts or professional. However, the process of dental screening usually takes into consideration the felt or

perceived need according to patients' complaints on their oral health conditions. Dental professional or a dental officer then assesses the suitability of dental treatment for the patients.

Dental treatment needs and the oral health status of Malaysians were periodically assessed every ten years from 1990 to 2010 using National Oral Health Survey of Adults (NOHSA). Since 2010, the oral health status and dental treatment needs in Malaysia have not been assessed at any national scale study. In the meantime, there are local studies that studied on specific dental treatment need, for instance the orthodontic treatment need among various study populations including of school children aged 12 and 16 years old (Zreaqat *et al.*, 2013), adolescents aged 13 to 14 years old (Zamzuri *et al.*, 2014), adults aged 20 to 70 years old (Ravindranath *et al.*, 2017) as well as among the special need people with Down Syndrome (Abdul Rahim *et al.*, 2014). Nevertheless, there are also researches that analysed on general dental treatment needs in certain populations in Malaysia, for instance, among the special need children in Negeri Sembilan, a state which is situated in the centre of Peninsular Malaysia (Mokhtar *et al.*, 2016); among normal (Oo *et al.*, 2011) and hearing-impaired school children (Rahman *et al.*, 2015) as well as among the elderly (Sinor, 2013; Sinor *et al.*, 2018) in Kelantan, a state located in the North East Region of Peninsular Malaysia.

However, there is no specific study that has contextualizes the dental treatment needs based on any university-based Malaysian dental institution. Dental Clinic at Kulliyah of Dentistry, International Islamic University Malaysia which is established in 2006 is the only university-based dental service provider in the city of Kuantan, Pahang, Malaysia and it is one of the two university-based dental centres that cater for the East Coast

region in Malaysia. The number of patients may reach up to 10,000 visits per year indicative for a high demand and need for dental treatment among the surrounding community. In view of this, this study aims to analyse the trend of major dental treatment need in this population.

Materials and Methods

Study Location and Data Collection

Ethical approval (IREC 762) was obtained from IIUM Research Ethics Committee. This study was conducted at IIUM Dental Outpatient Clinic in Kuantan, Pahang. Kuantan is the capital city of Pahang, situated at the East Coast region of Peninsular Malaysia. Our study population was all first-visit patients undergoing screening at IIUM Dental Outpatient Clinic from 1st January 2016 until 31st December 2016. Information on patient's age, gender, residential area and the type of dental treatment needs was retrieved from Outpatient Clinic database. Type of treatment needs were decided by dental officer in-charge at this clinic after carrying out the usual procedure of screening and dental charting for patient's oral health condition. Treatment need was then notified in the patient's folder, and was remarked into the Patient Waiting List of any departments according to their treatment needs. Patients with incomplete data or with old Malaysian identification card or foreign passport and those attended Orthodontic department are excluded.

For demographic profile analysis, patients were classified based on their age group, gender and residential area in Kuantan. Age were classified into six groups of 14 years old and below, 15 to 19 years old, 20 to 34 years old, 35 to 44 years old, 45 to 64 years old, and 65 years old and above. Residential areas were classified into urban and non-urban areas according to Kuantan Municipal

Council. Dental treatment needs was classified as stated in the clinic database; endodontics (anterior), endodontics (posterior), fixed prosthetic (bridge), fixed prosthetic (crown), partial denture, full denture, paediatric dentistry, oral surgery, general dental practice, oral maxillofacial, conservative care and periodontal need.

Statistical Analysis

Descriptive statistics was used to analyze the demographic profiles of this population. Association of demographic background (age, gender and residential areas) with the type of dental treatment needs was analysed using Chi-Square test in SPSS® software Version 20.

Results

Demographic Profiles

Demographic profiles of first-visit patients at IIUM Dental Outpatient Clinic for the year 2016 are tabulated in Table 1. The major age group of patients was from the age of 20 to 34 years old (39.5 %) while the least number of patients was from the age group of 65 and above (4.2 %). The mean age of the patients was 32 ± 17.61 years old. Female patients (55.5 %) outnumbered male patients (44.5 %) with majority of patients residing non-urban areas (37.6 %).

Dental Treatment Needs

Figure 1 shows distribution of dental treatment needs in which the highest treatment need was conservative care (22.7 %) while the lowest treatment need was for oral maxillofacial care (0.6 %).

Association of demographic profiles with types of dental treatment needs

Table 2 shows cross tabulation of age with the type of dental treatment needs. There is significant association between age, $X^2 (55, N = 2,627) =$

3,466.9, $p < .0001$ with the type of dental treatment needs. Paediatric patients (age group of ≤ 14) were almost exclusively assigned to receive paediatric dentistry care (97.5 %). Younger-age patients (age group of 15-19, 20-34 and 35-44) mostly required conservative care (38.9 %, 30.9 % and 30.3 %, respectively), followed by periodontal need (17.2 %, 24.5 % and 17.0 %, respectively). Elder-age patients (age group of 45-64 and ≥ 65) have major need for prosthodontics with 30.5 % and 40.5 %, respectively for partial dentures and 9.4 % and 31.5 %, respectively for full dentures. The need for partial dentures increases with increasing age, this is noticeable from the age group 35-44 (8.9 %), 45-64 (30.5 %) and ≥ 65 (40.5 %). This is also similar to the need for full dentures that begins from the age group of 45-64 (9.4 %) and drastically increased in the age group of ≥ 65 (31.5 %).

In contrast, the need for oral surgery decreases with increasing age; the need was highest among patients from the age groups of 20-34 (17.9 %), 35-44 (16.7 %), 45-64 (9.6 %) and ≥ 65 (8.1 %). The need for oral maxillofacial care is consistently low compared to other treatment needs across all age groups. This study also found that types of dental treatment needs also significantly differed by gender, $X^2 (11, N = 2,627) = 49.8$, $p < .0001$. As cross tabulated in Table 3, females outnumbered males in all types of dental treatment need, except for periodontal need which was predominated by males. The relation between residential areas and the type of dental treatment need was also significant, $X^2 (11, N = 2,627) = 112.6$, $p < .0001$.

As shown in Table 4, people residing non-urban areas outnumbered those residing urban areas in getting fixed-prosthetic (bridge) (50.6 %), fixed-prosthetic (crown) (58.5 %), partial denture (60.0 %), full denture (79.1 %), paediatric dentistry care (62.3 %), oral surgery (57.6 %), general dental practice (52.6 %) and periodontal care (51.7 %).

Table 1. Demographic profiles of patients underwent for screening at IIUM Dental Outpatient Clinic for the year 2016.

Demographic Profiles	n (% of total)
Age	
≤14	434(16.5 %)
15 to 19	157(6.0 %)
20 to 34	1,037 (39.5 %)
35 to 44	347 (13.2 %)
45 to 64	541 (20.6 %)
≥65	111 (4.2 %)
	Total = 2,627 (100.0 %)
Gender	
Male	1,168 (44.5 %)
Female	1,459 (55.5 %)
	Total = 2,627(100.0 %)
Residential Areas	
Urban	1,251 (47.6%)
Non-urban	1,376 (52.4%)
	Total=2,627 (100.0%)

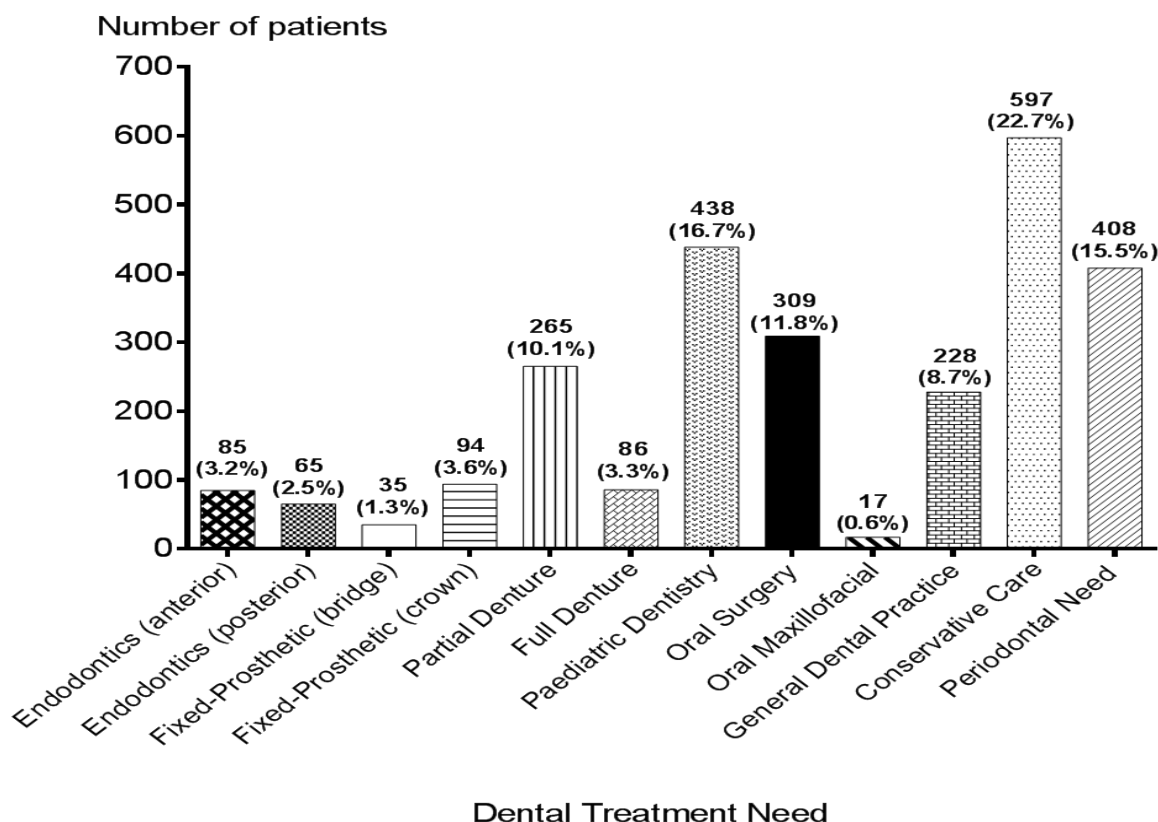


Figure 1. Distribution of dental treatment needs among patients underwent for screening at IIUM Dental Outpatient Clinic for the year 2016.

Table 2. Cross tabulation of dental treatment needs versus age of patients underwent for screening at IIUM Dental Outpatient Clinic for the year 2016

Age group	Dental Treatment Needs													Total	Statistical Analysis			
	a	b	c	d	e	f	g	h	i	j	k	l						
≤14																		
Count	0	0	0	1	0	0	423	0	0	3	2	5	434	$\chi^2 (55, N = 2,627) = 3,466.9, p < .0001$				
% within age	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	97.5%	0.0%	0.0%	0.7%	0.5%	1.2%	100.0%					
% within treatment	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	96.6%	0.0%	0.0%	1.3%	0.3%	1.2%	16.5%					
15 to 19																		
Count	13	4	1	4	1	0	15	4	4	23	61	27	157					
% within age	8.3%	2.5%	0.6%	2.5%	0.6%	0.0%	9.6%	2.5%	2.5%	14.6%	38.9%	17.2%	100.0%					
% within treatment	15.3%	6.2%	2.9%	4.3%	0.4%	0.0%	3.4%	1.3%	23.5%	10.1%	10.2%	6.6%	6.0%					
20 to 34																		
Count	49	32	10	37	23	0	0	186	11	115	320	254	1,037					
% within age	4.7%	3.1%	1.0%	3.6%	2.2%	0.0%	0.00%	17.9%	1.1%	11.1%	30.9%	24.5%	100.0%					
% within treatment	57.6%	49.2%	28.6%	39.4%	8.7%	0.0%	0.00%	60.2%	64.7%	50.4%	53.6%	62.3%	13.2%					

Note: Treatment a-Endodontics (Anterior), b-Endodontics (Posterior) c-Fixed-prosthetics (Bridge), d-Fixed-Prosthetics (Crown), e- Partial Denture, f-Full Denture, g-Paedodontics, h-Oral Surgery, i-Oral Maxillofacial, j-General Dental Practice, k-Conservative Care and l-Periodontal Need. Chi-square test, $\chi^2 (55, N = 2,627) = 3,466.9, p < .0001$

Table 2. (Continued)

Age group	Dental Treatment Needs													Statistical Analysis	
	a	b	c	d	e	f	g	h	i	j	k	l	Total		
35 to 44															$\chi^2 (55, N = 2,627) = 3,466.9, p < .0001$
Count	13	15	8	21	31	0	0	58	1	36	105	59	347		
% within age	3.7%	4.3%	2.3%	6.1%	8.9%	0.0%	0.0%	16.7%	0.3%	10.4%	30.3%	17.0%	100.0%		
% within treatment	15.3%	23.1%	22.9%	22.3%	11.17%	0.0%	0.0%	18.8%	5.9%	15.8%	17.6%	14.5%	39.5%		
45 to 64															
Count	9	14	15	30	165	51	0	52	0	44	105	56	541		
% within age	1.7%	2.6%	2.8%	5.5%	30.5%	9.4%	0.0%	9.6%	0.0%	8.1%	19.4%	10.4%	100.0%		
% within treatment	10.6%	21.5%	42.9%	31.9%	62.3%	59.3%	0.0%	16.8%	0.0%	19.3%	17.6%	13.7%	20.6%		
≥65															
Count	1	0	1	1	45	35	0	9	1	7	4	7	111		
% within age	0.9%	0.0%	0.9%	0.9%	40.5%	31.5%	0.0%	8.1%	0.9%	6.3%	3.6%	6.3%	100.0%		
% within treatment	1.2%	0.0%	2.9%	1.1%	17.0%	40.7%	0.0%	2.9%	5.9%	3.1%	0.7%	1.7%	4.2%		
Total	85	65	35	94	265	86	438	309	17	228	597	408	2,627		

Note: Treatment a-Endodontics (Anterior), b-Endodontics (Posterior) c-Fixed-prosthetics (Bridge), d-Fixed-Prosthetics (Crown), e- Partial Denture, f-Full Denture, g-Paedodontics, h-Oral Surgery, i-Oral Maxillofacial, j-General Dental Practice, k-Conservative Care and l-Periodontal Need. Chi-square test, $\chi^2 (55, N = 2,627) = 3,466.9, p < .0001$

Table 3. Cross tabulation of dental treatment needs versus gender of patients underwent for screening at IIUM Dental Outpatient Clinic for the year 2016

Gender	Dental Treatment Needs													Statistical Analysis		
	a	b	c	d	e	f	g	h	i	j	k	l	Total			
Male																
Count	32	26	15	32	93	37	178	152	2	93	319	189	1,168	$\chi^2 (11, N = 2,627) = 49.8, p < .0001$		
% within gender	2.7%	2.2%	1.3%	2.7%	8.0%	3.2%	15.2%	13.0%	0.2%	8.0%	27.3%	16.2%	100.0%			
% within treatment	37.6%	40.0%	42.9%	34.0%	35.1%	43.0%	40.6%	49.2%	11.8%	40.8%	53.4%	46.3%	44.5%			
Female																
Count	53	39	20	62	172	49	260	157	15	135	278	219	1,459			
% within gender	3.6%	2.7%	1.4%	4.2%	11.8%	3.4%	17.6%	10.8%	1.0%	9.3%	19.1%	15.0%	100.0%			
% within treatment	62.4%	60.0%	57.1%	66.0%	64.9%	57.0%	59.4%	50.8%	88.2%	59.2%	46.6%	53.7%	55.5%			
Total	85	65	35	94	265	86	438	309	17	228	597	408	2,627			

Note: Treatment a-Endodontics (Anterior), b-Endodontics (Posterior) c-Fixed-prosthetics (Bridge), d-Fixed-Prosthetics (Crown), e- Partial Denture, f-Full Denture, g-Paedodontics, h-Oral Surgery, i-Oral Maxillofacial, j-General Dental Practice, k-Conservative Care and l-Periodontal Need. Chi-square test, $\chi^2 (11, N = 2,627) = 49.8, p < .0001$

Table 4. Cross tabulation of dental treatment needs versus residential area of patients underwent for screening at IIUM Dental Outpatient Clinic for the year 2016

Residential Areas	Dental Treatment Needs													Statistical Analysis			
	a	b	c	d	e	f	g	h	i	j	k	l	a				
Urban																	
Count	43	38	17	42	106	18	165	131	10	108	376	197	1,251				
% within gender	3.4%	3.0%	1.4%	3.4%	8.5%	1.4%	13.2%	10.5%	0.8%	8.6%	30.1%	15.7%	100.0%				
% within treatment	50.6%	58.5%	48.6%	44.7%	40.0%	20.9%	37.7%	42.4%	58.8%	47.4%	63.0%	48.3%	47.6%	χ^2 (11, N = 2,627) = 112.6, p<.0001			
Non-urban																	
Count	42	27	18	52	159	68	273	178	7	120	221	211	1,376				
% within gender	3.1%	2.0%	1.3%	3.8%	11.6%	4.9%	19.8%	12.9%	0.5%	8.7%	16.1%	15.3%	100.0%				
% within treatment	49.4%	41.5%	51.4%	55.3%	60.0%	79.1%	62.3%	57.6%	41.2%	52.6%	37.0%	51.7%	52.4%				
Total	85	65	35	94	265	86	438	309	17	228	597	408	2,627				

Note: Treatment a-Endodontics (Anterior), b-Endodontics (Posterior) c-Fixed-prosthetics (Bridge), d-Fixed-Prosthetics (Crown), e- Partial Denture, f-Full Denture, g-Paedodontics, h-Oral Surgery, i-Oral Maxillofacial, j-General Dental Practice, k-Conservative Care and l-Periodontal Need. Chi-square test, χ^2 (11, N = 2,627) = 112.6, p < .0001.

Discussion

The predominant need among teenage to adult patients was conservative care, followed closely by periodontal need. The main reason for the high demand for conservative and periodontal care was perhaps due to the high prevalence of caries and gingivitis among Malaysian adults. According to National Oral Health Survey of Adult (NOHSA) in 2010, about 94.0 % of Malaysian adult population had periodontal disease while 88.9 % of Malaysian population had dental caries experience.

This study also shows that majority of the first-visit patients at this clinic were females. This scenario was also observed in Turkish population (Pekiner *et al.*, 2010), and in fact, a previous study in Southern China has also shown that females were more likely to visit dental service provider (Lo *et al.*, 2001). Other than that, NOHSA 2010 also reported a higher proportion of females (53.1 %) that sought after dental treatment at public dental provider compared to males (49.3 %). This female predilection might be due to the difference of oral health between men and women, especially at certain age. The disparity in oral health increases between the genders as a population ages, which may relate to the combination of reproductive hormones influences, pregnancy, diet, as well as morning sickness during pregnancy in women (Lukacs, 2011). Other than pregnancy, menopause is also associated with increased risk of oral health complication, especially in women who developed osteoporosis (Branch-Elliman, 2012). Another plausible reason is that women visit more dental and oral health service providers because they usually are more attentive towards the aesthetics inclusive of the teeth (Akbar *et al.*, 2019).

In addition to gender, age also have significant association with the type of dental treatment need. This study

shows that younger-age patients mostly required conservative care while the elder-age patients have major need for prosthodontics, either partial or full dentures. In agreement with this, prosthodontics was the most required treatment need among the elderly patients in Turkish (Pekiner *et al.*, 2010) as well as in Northeast China (Liu *et al.*, 2015) population. This study also shows that the need for partial and full dentures increases with increasing age. This is actually consistent with findings in NOHSA 2010 in which the study has shown that the number of edentulous significantly increases from the age of 35 (1.1 %) to the age 65 (35.6 %) and 75 (53.3 %). When the patient becomes edentulous, then the need for tooth extraction is nullified. The need for oral maxillofacial care which includes treatment for temporomandibular joint symptoms, operculectomy, pericoronitis and bruxism is consistently low compared to other treatment need across all age groups.

Residential area also has significant association with the type of dental treatment need. This study shows that people residing non-urban areas outnumbered those residing urban areas to receive fixed prosthetics of either bridge or crown; partial and full dentures; paedodontic care; periodontal treatment; and being referred to oral surgery and general dental practice departments. In general, people living in rural areas tend to have lower oral health problem, has more caries and fewer teeth compared to the urban residents (Akbar *et al.*, 2019). However, the geographical location of this dental institution and the convenient of transportation made this institution still accessible to both the urban and non-urban residents.

Conclusion

Conservative care was the major dental treatment need identified in this study population. The type of dental treatment

need has significant association with patient's age, gender and residential area. This finding substantially helps in understanding of dental treatment need, especially within the context of a university-based dental care provider in the East Coast region of Peninsular Malaysia.

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