

Utilisation trends and oral health-related quality of life among patients attending Visiting Dental Services in Selangor

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Abstract

This study aimed to assess utilisation trends and oral health-related quality of life (OHRQoL) among patients attending Visiting Dental Service (VDS) in Selangor, Malaysia. This two-phased study involved a secondary analysis of data from the Selangor VDS's (seventeen VDSs) patient database (2017 to 2019) and a cross-sectional survey among patients from twelve VDSs. A self-administered questionnaire that consisted of a validated Short Oral Health Impact Profile (S-OHIP) scale was used. The S-OHIP score for each participant was calculated using Additive Scores (ADD) that range from being the "least affected" with a score of 0 to the "most affected" with a score of 56. Statistical analysis was done using a t-test and one-way ANOVA, with the statistical significance set at $p=0.05$. This study found that the adult group and Malay ethnicity recorded the highest attendance from 2017 to 2019. Extraction of permanent teeth was the most frequently provided treatment from 2017 to 2019 (70.2%, 67.6%, 61.2%). A total of 124 respondents from twelve VDSs completed the survey. The mean age was 32.72 ± 9.75 years old. The respondents' mean total score of S-OHIP was 9.69 ± 7.64 and significantly differed by gender ($p=0.007$). The S-OHIP dimension that mainly affected the respondents was psychological discomfort due to 'food stuck' (18.5%). VDS utilisation trends in Selangor increased from 2017 to 2019, with dental extraction being the treatment in demand. The OHRQoL of patients attending the VDSs was encouraging despite the less-than-ideal condition, highlighting the urgent need for a more permanent solution to VDS.

Keywords: Oral Health-Related Quality of Life, Short Oral Health Impact Profile (S-OHIP), Visiting Dental Service

Introduction

Oral healthcare services were still underutilised in Malaysia, particularly among adults and young children (NIH, 2019). Parts of the reasons for the poor utilisation of oral healthcare were work or other responsibilities and the inability to take time off (NIH, 2019). In addition, the general perception of oral healthcare needs

remains low among the population, and there was a lack of awareness about the importance of regular dental visits to maintain optimal oral health (NIH, 2019).

A local study on the prevalence of oral healthcare utilisation in the last 12 months was 13.2% (Tan *et al.*, 2021), which was lower than the finding in the National Oral Health Survey of Adults 2010 (NOHSA 2010), with 27.4% (OHD, 2013; NIH, 2019).

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Furthermore, about 15% of the Malaysian population had never seen a dentist in their lifetime (NIH, 2019). It was evidenced that the utilisation of oral healthcare was discouraged by a majority of individuals who believed they were not sick enough to seek care and those who self-medicate while they were sick (Varenne *et al.*, 2006; Agbor & Azodo, 2011). In addition, diverse demographic and socioeconomic characteristics were considered important factors influencing oral healthcare utilisation in Malaysia (Tan *et al.*, 2021).

Recognising the relationship between individuals' quality of life and oral health is crucial as their interplay significantly impacts an individual's daily functioning. Furthermore, according to Sischo and colleagues, oral health-related quality of life (OHRQoL) is an integral part of general health and well-being (Sischo & Broder, 2011). By definition, OHRQoL is defined by an individual's subjective evaluation of how one's well-being is influenced by factors such as comfort during eating, sleeping, social interaction, self-confidence, and contentment with oral health (DHHS, 2000). Research exploring OHRQoL provides valuable insights into various facets of an individual's functional and emotional well-being, satisfaction and expectations with care, and self-perception (Sischo & Broder, 2011). A widely used epidemiological measure of OHRQoL, developed by Slade and Spencer, was called the Oral Health Impact Profile (OHIP) (Slade & Spencer, 1994). OHIP comprises 49 items, categorised into seven domains such as functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap (Slade & Spencer, 1994). OHIP was translated and validated into Malay (Saub *et al.*, 2007). The short version, designated as the S-OHIP(M), which contains 14 items of 7 domains, is also available. OHIP has been used in several studies in Malaysia to assess the OHRQoL of a particular population, such as the residents of nursing homes in Terengganu, Malaysia (Mohd *et al.*, 2020) and individuals with and without temporomandibular disorders (TMD) (Mohamad *et al.*, 2019). However, no published study has been found that

measures OHRQoL among patients attending public oral healthcare in Malaysia.

Oral healthcare service is one of the essential services provided by the Ministry of Health Malaysia (MOH) to its population. Healthcare within the public sector provides universal and comprehensive healthcare coverage funded by general taxation. In addition to dental clinics, oral healthcare services are delivered in schools, mobile dental clinics, and teams such as flying squads.

Regarding different types of dental clinical settings available in the MOH, the ministry has established the Visiting Dental Service (VDS) at the local Health Clinic (Klinik Kesihatan). The VDS also aims to increase access to dental services within the population, especially in densely populated areas with limited oral health personnel. The government dental teams from the nearby district primary dental clinics generally provide the VDS. The VDS is responsible for providing primary dental treatments such as dental examination, tooth filling, and tooth extraction to the population.

Health Clinic with VDS usually has one dental surgery room with equipment similar to any other dental surgery room. However, areas such as the waiting areas for the patients have to be shared with other units in the Health Clinic. The lack of human resources and specific dental equipment renders it unable to function as a main dental clinic. The types of dental treatment offered may be limited due to the inadequate facilities at the clinic. In practice, the VDS is regularly scheduled in periodic weekly, fortnightly, or monthly visits. The scheduling mainly depends on dental personnel's availability from the main dental clinic. The delivery method of dental service of VDS is quite similar to the dental care delivery commissioned by the Nganampa Health Council Dental Programme on the Anangu Pitjantjatjara Yankunytjatjara (APY) Lands in the northwest of South Australia (Wooley, 2006).

Until 2021, there were seventeen VDSs from seven districts (Gombak, Hulu Selangor,

Klang, Kuala Langat, Kuala Selangor, Sabak Bernam, and Sepang) in Selangor that were still operating. Various efforts were being made by all State Oral Health Divisions to upgrade the VDS to function as a main dental clinic.

This study highlights the utilisation trends of the VDSs in Selangor, Malaysia. The estimated population of Selangor, including non-citizens, in 2020 is 6,538,100 (DOSM, 2021). Data from the Health Informatics Centre, MOH revealed that the public dental facility ratio to Selangor population till 31st December 2018 was 1:30,104 (MOH, 2019). This ratio was the highest in Malaysia. This shows that Selangor needs a high number of dental facilities to meet the oral health needs of its population. Although private oral health services can help to reduce this figure, a study found that the public sector remains the primary supplier of oral healthcare (80.7%) and has remained consistent over time (NIH, 2019).

This study aimed to assess utilisation trends and oral health-related quality of life (OHRQoL) among patients attending VDSs in the state of Selangor, Malaysia. Selangor, which has the highest population in Malaysia, is seen as needing more dental service facilities than other states. To visualise the population's overall acceptance of the VDSs, it is important to understand the impact the VDSs have on the population by focusing on the utilisation trends of VDSs. The local population's need for oral health care will indicate the necessity to maintain or upgrade the existing facilities. Assessment of OHRQoL is also necessary among patients to see the impact of oral health on their quality of life. Findings from this study can be used for future planning of the public oral healthcare facilities, particularly in Selangor.

Materials and Methods

Sampling

This study comprised two phases. Phase 1 was a retrospective study that analysed data from the VDS's patient database in Selangor from 2017 to 2019. Phase 2 was a cross-sectional quantitative survey using a self-

administered questionnaire at selected VDSs in the Health Clinics. Data collection for Phase 1 was done in May 2021, and Phase 2 was carried out in June and July 2021.

The sampling method for Phase 2 of the study was convenience sampling due to limited resources and time constraints. The Movement Control Order implemented in Selangor due to the COVID-19 pandemic further worsened the time constraint. It has affected both the movement of the researcher and the operating hours of all VDSs in the state of Selangor. There was an overall reduction in patient attendance in all VDSs. Random sampling was not feasible in this study where specific practical criteria were met, such as easy accessibility, availability at a given time, or the willingness to participate in the study (Dörnyei, 2007). The sample size calculation was done using Epiinfo™ software with a confidence interval set at 95%. The finalised sample size needed in this study after 10% consideration of non-respondents (Shiv Kumar Mudgal *et al.*, 2020) was 101 participants.

Data instrumentations

Two separate datasheets were prepared for the secondary data collection in Phase 1. The first data sheet collected the total number of patients who visited the VDSs by different categorisations. The categorisation was as follows: 0 to 6 years old, primary school children, secondary school children, special needs, antenatal mothers, adults, and elderly. The patients' ethnicities were also captured and entered into the datasheet. The second datasheet was prepared to collect the total number of dental treatments by the category of patient and the type of dental treatment delivered. The study only collected data 3 years before the COVID-19 pandemic because most VDSs operated according to the schedule before the pandemic.

The questionnaire of Phase 2 consisted of two main sections; i) Demographic Profile and ii) S-OHIP(M). The questionnaire was in Malay and had close-ended questions. S-OHIP(M) section contained fourteen items divided into seven domains: i) functional

limitation, ii) physical pain, iii) psychological discomfort, iv) physical disability, v) psychological disability, vi) social disability, and vii) handicap (Saub *et al.*, 2005). The respondents answered the questions using a five-point frequency Likert scale (very often, quite often, sometimes, seldom, and never) (Saub & Locker, 2006).

Data analysis

Phase 1 and 2 data was analysed using IBM Statistical Package for Social Science (SPSS) Statistics Software Version 27. Data cleaning was performed, which involved detecting, diagnosing, and editing corrupted data (Van den Broeck *et al.*, 2005). This was accomplished by running the frequency distribution for each item and ensuring that only the correct number ranges were used. If any coding numbers were invalid or questionable, the original data report of Phase 1 and the questionnaire of Phase 2 were referred to the correct answer. In the case of missing data in Phase 2, all respondents with missing data were included for descriptive analysis. However, the total exclusion of the respondents with missing data on questions using the Likert scale was done to the S-OHIP score's numerical data.

For data scoring of the S-OHIP(M), responses were made on a five-point Likert-type scale and coded 4= 'very often', 3 = 'quite often', 2 = 'sometime', 1= 'seldom' and 0= 'never' (Slade, 1997). The response of 'don't know' was coded as missing. The additive score (ADD) was used to compute the S-OHIP(M) score for each respondent (Allen & Locker, 1997). The ADD scores were calculated by summing the response codes for the 14 items and ranged from 0 to 56. The higher the scores of ADD, the worse the OHRQoL (Saub *et al.*, 2005).

A histogram plot was used to check the normality of the data. The data was discovered to be approximately normally distributed. The association of mean total S-OHIP score with two categorical variables

was examined by independent t-test, while one-way ANOVA was applied to examine the association of mean total S-OHIP score with three or more categorical variables. Statistical significance was set at $p \leq 0.05$.

Ethics

Ethical clearance was obtained from the Research Ethics Committee of the Universiti Teknologi MARA's Faculty of Dentistry and the MOH's Medical Research Ethics Committee (MREC). This study was also registered with the National Medical Research Registry (NMRR), MOH (NMRR-21-388-58227 (IIR)) and granted permission from the Oral Health Programme, MOH to conduct the study at the selected VDS facilities.

Results

Phase 1

Data from seventeen participating VDSs was analysed. Generally, the number of 'new' (first-time attendees in that year) and total (new and recurrent) patients for the entire VDSs increased from 2017 to 2019 (Table 1). Six VDSs showed a consistent increase of 'new' attendance from the year 2017 to 2019, which were VDS Kuang, Sg. Dusun Kg.Soeharto, Jenjarom, Telok Panglima Garang, Bagan Terap and Dengkil. The same VDSs, including VDS Selisik, showed a consistent increase in total attendance from 2017 to 2019.

In terms of group comparison by category (Table 2), the adult group recorded the highest total attendance from 2017 to 2019, with 2444, 2492, and 3483 adult patients, respectively, for each year, with an overall of 8419 adult patients compared to other groups. It was followed by the antenatal group with 1783, 2359, and 2645 patients, respectively, for the years 2017, 2018, and 2019. The smallest number in attendance for new patients and total visits for each year was the special needs group.

Table 1. New and total attendance by VDSs, 2017-2019.

VDS	2017		2018		2019	
	New	Total	New	Total	New	Total
Batu Arang	888	1111	782	1083	882	1181
Kuang	770	914	827	981	843	1001
Kalumpang	280	340	242	290	301	416
Rasa	128	144	97	104	528	686
Selisik	91	94	89	100	224	272
Sg Dusun Kg Soeharto	204	255	248	268	368	442
Pulau Indah	255	304	166	196	298	337
Pulau Ketam	119	145	128	158	55	64
Bandar	219	220	97	98	122	122
Bukit Changggang	162	167	170	183	148	179
Jenjarom	654	694	840	1008	1141	1448
Telok Panglima Garang	258	300	495	573	553	661
Ijok	172	183	151	156	175	187
Jeram	742	978	506	622	662	844
Bagan Terap	120	149	127	150	271	341
Sg Air Tawar	62	69	56	56	113	120
Dengkil	489	717	1025	1043	1395	1458
Total	5613	6784	6046	7069	8079	9759

Regarding ethnicity (Table 3), the Malay ethnicity recorded the highest percentage for new attendance (75.1%, 76.3%, 77.7%) and total overall attendance (73.7%, 74.9%, 76.4%), respectively, for each year (2017-2019). Meanwhile, the number of new and total attendance of Chinese and Indian ethnicity were roughly comparable, ranging from 9-12%.

Extraction of permanent teeth was the most frequently provided treatment from 2017 to 2019 (70.2%, 67.6%, 61.2%), followed by extraction of deciduous teeth (13.2%, 13.4%, 12.2%). The least frequently provided treatments were surgical treatment and treatment for complications after tooth extraction.

Phase 1 of the study also documented the type and number of treatments performed in the VDSs from 2017 to 2019 (Table 4).

Table 2. The distribution of new and total attendance by category of patient, 2017-2019.

Patient Category	Year							
	2017*		2018		2019		Total**	
	New (%)	Total (%)	New (%)	Total (%)	New (%)	Total (%)	New (%)	Total (%)
0 to 6 years old	516 (19.0%)	593 (19.8%)	745 (27.4%)	812 (27.1%)	1460 (53.7%)	1593 (53.1%)	2721 (100%)	2998 (100%)
Primary school Children	315 (26.1%)	369 (25.6%)	370 (30.6%)	445 (30.9%)	523 (43.3%)	626 (43.5%)	1208 (100%)	1440 (100%)
Secondary school Children	63 (22.1%)	68 (21.3%)	63 (22.1%)	67 (21.0%)	159 (55.8%)	184 (57.7%)	285 (100%)	319 (100%)
Antenatal mother	1761 (26.4%)	1783 (26.3%)	2339 (35.0%)	2359 (34.8%)	2576 (38.6%)	2645 (39.0%)	6676 (100%)	6787 (100%)
Adult (18 to 59 years old)	1951 (29.6%)	2444 (29.0%)	1980 (30.0%)	2492 (29.6%)	2659 (40.3%)	3483 (41.4%)	6590 (100%)	8419 (100%)
Elderly (60 years old and above)	506 (29.5%)	788 (27.7%)	526 (30.7%)	860 (30.2%)	682 (39.8%)	1198 (42.1%)	1714 (100%)	2846 (100%)
Special needs	12 (21.8%)	22 (25.6%)	23 (41.8%)	34 (39.5%)	20 (36.4%)	30 (34.9%)	55 (100%)	86 (100%)

* Year of 2017- VDS Dengkil not included

** % within the category of patient

Table 3. New and total attendance of patients by ethnicity, 2017-2019.

Ethnicity	Year					
	2017*		2018		2019	
	New N (%)	Total N (%)	New N (%)	Total N (%)	New N (%)	Total N (%)
Malay	3846 (75.1%)	4474 (73.7%)	4615 (76.3%)	5296 (74.9%)	6279 (77.7%)	7456 (76.4%)
Chinese	523 (10.2%)	685 (11.3%)	628 (10.4%)	807 (11.4%)	761 (9.4%)	1029 (10.5%)
Indian	610 (11.9%)	741 (12.2%)	648 (10.7%)	798 (11.3%)	827 (10.2%)	1041 (10.7%)
Other	92 (1.8%)	107 (1.8%)	107 (1.8%)	117 (1.7%)	161 (2.0%)	173 (1.8%)
Non-citizen	53 (1.0%)	60 (1.0%)	48 (0.8%)	51 (0.7%)	51 (0.6%)	60 (0.6%)
Total**	5124 (100.0%)	6067 (100.0%)	6046 (100.0%)	7069 (100.0%)	8079 (100.0%)	9759 (100.0%)

*Year of 2017- VDS Dengkil not included

**% within year

Table 4. The distribution of dental treatments provided in VDSs in Selangor, 2017-2019.

Types of Treatment	Year			
	2017*	2018	2019	Total
	N (%)	N (%)	N (%)	N (%)
Restoration of deciduous teeth	70 (2.5)	54 (1.7)	136 (3.1)	260 (2.5)
Restoration of permanent teeth	88 (3.1)	184 (5.9)	418 (9.4)	690 (6.6)
Extraction of deciduous teeth	375 (13.2)	419 (13.4)	544 (12.2)	1338 (12.8)
Extraction of permanent teeth	1993 (70.2)	2115 (67.6)	2731 (61.2)	6839 (65.6)
Scaling	84 (3.0)	149 (4.8)	332 (7.4)	565 (5.4)
Abscess	230 (8.1)	200 (6.4)	293 (6.6)	723 (6.9)
Complication after extraction	1 (0.04)	5 (0.2)	3 (0.1)	9 (0.1)
Surgical	0 (0.0)	2 (0.1)	2 (0.04)	4 (0.03)
Total**	2841 (100.0)	3128 (100.0)	4459 (100.0)	10428 (100.0)

*Year of 2017- VDS Dengkil not included

**% within year

Phase 2

The finalised number of respondents that met the inclusion criteria for Phase 2 was 124 from 12 VDSs. Table 5 shows the sociodemographic of participants who completed the questionnaires. The study participants were 18 to 68 years old, with a

mean age of 32.72 ± 9.75 . Table 6 shows the response to each of the S-OHIP items. The mean total score was 9.69 ± 7.64 . The most frequently ('very often' and 'quite often') reported S-OHIP dimension that affected was psychological discomfort due to 'food getting stuck between teeth or dentures', 23(18.5%) followed by 'feeling shy due to their oral health problems', 14(11.3%).

Table 5. Sociodemographic background of the respondents.

Sociodemographic	*N	*%
Gender		
Male	16	12.9
Female	108	87.1
Ethnicity		
Malay	107	86.3
Chinese	4	3.2
Indian	11	8.9
Others	2	1.6
Age group		
18-39 years old	102	82.3
40-59 years old	19	15.3
60 & above	3	2.4
Education level		
No formal education and primary school	5	4.0
Secondary school	57	46.0
College and higher	61	49.2
Occupational		
Government	28	22.6
Private	34	27.4
Self-employed	13	10.5
Unemployed	49	39.5
Retired	0	0.0
Transportation to clinic		
Own transport	119	96.0
Public transport	4	3.2
Other	0	0.0
Distance between home and clinic		
Less than 5km	64	51.6
5 to 10km	43	34.7
More than 10km	17	13.7
Desired dental treatment		
Oral examination	35	28.2
Scaling	23	18.5
Filling	6	4.8
Tooth extraction	19	15.3
Others with reason stated	2	1.6
Other with no reason stated	34	27.4
More than 1 treatment	5	4.0

*Frequency and percentage with missing data

Table 6. Prevalence of response to Short Oral Health Impact Profile (S-OHIP).

Domain and Items	Very Often N (%)	Quite often N (%)	Sometimes N (%)	Seldom N (%)	Never N (%)
Functional limitation					
Difficulty chewing any food (N=119)	1(0.8)	3(2.4)	14(11.3)	41(33.1)	60(48.4)
Problems cause bad breath (N=112)	0(0.0)	8(6.5)	27(21.8)	49(32.3)	37(29.8)
Physical pain					
Discomfort eating any food (N=116)	0(0.0)	7(5.6)	20(16.1)	35(28.2)	54(43.5)
Ulcer in mouth (N=117)	0(0.0)	0(0.0)	21(16.9)	45(36.3)	51(41.1)
Psychological discomfort					
Discomfort due to food getting stuck (N=122)	3(2.4)	20(16.1)	33(26.6)	56(45.2)	10(8.1)
Felt shy (N=118)	1(0.8)	13(10.5)	16(12.9)	37(29.8)	51(41.1)
Physical disability					
Avoided to eat certain foods (N=118)	2(1.6)	8(6.5)	17(13.7)	39(31.5)	52(41.9)
Avoided to smile (N=120)	3(2.4)	5(4.0)	7(5.6)	26(21.0)	79(63.7)
Psychological disability					
Sleep has been disturbed (N=121)	1(0.8)	2(1.6)	14(11.3)	34(27.4)	70(50.5)
Concentration has been disturbed (N=123)	0(0.0)	7(5.6)	12(9.7)	38(30.6)	66(53.2)
Social disability					
Avoided to go out (N=123)	0(0.0)	1(0.8)	7(5.6)	9(7.3)	106(85.5)
Problems in daily activities (N=123)	0(0.0)	0(0.0)	17(13.7)	19(15.3)	87(70.2)
Handicap					
Spent a lot of money (N=123)	0(0.0)	2(1.6)	8(6.5)	26(21.0)	87(70.2)
Felt less confident (N=123)	0(0.0)	9(7.3)	7(5.6)	34(27.4)	73(58.9)

*Frequency and percentage with missing data.

Table 7 shows factors associated with the mean S-OHIP score. The mean total S-OHIP score between males and females differed significantly (p=0.007). The mean total S-

OHIP scores were not significantly different between ethnicity (p=0.130), age group (p=0.962), education level group (p=0.801) and occupation (p=0.566).

Table 7. Associated factors with S-OHIP Score.

Variables	*S-OHIP score Mean (SD)	P-value
Gender		
Male (N=11)	15.45 (7.66)	0.007
Female (N=86)	8.95(7.36)	
Ethnicity		
Malay (N=85)	10.32 (7.76)	0.130
Chinese (N=2)	1.00 (1.41)	
Indian (N=8)	5.50 (5.50)	
Other (N=2)	8.50 (0.71)	
Age group		
18-39 years old (N=82)	9.6 (7.38)	0.962
40-59 years old (N=14)	10.21 (9.54)	
60 & above (N=1)	10.00 (0.00)	
Education level group		
No formal education & primary school (N=2)	9.50 (0.71)	0.801
Secondary school (N=43)	9.12 (7.95)	
College & higher (N=52)	10.17 (7.57)	
Occupation		
Government (N=26)	10.77 (8.68)	0.566
Private (N=26)	9.00 (6.69)	
Self-employed (N=8)	12.25 (8.87)	
Unemployed (N=37)	8.86 (7.30)	

*Without missing data.

Discussion

Patient's utilisation trends of VDS

Despite the increasing trends in the overall attendance of the VDS from 2017 to 2019, the utilisation of VDSs was considered low. It is similar to a study highlighting the Malaysian population's low utilisation rate. Despite the MOH's attempts to encourage participation and utilisation of oral healthcare services, oral healthcare

utilisation remains low in Malaysia (Tan *et al.*, 2021). However, this study did not focus in-depth on the factors that lead to the lack of utilisation of VDSs.

Several demographic groups continue to have discrepancies in dental care utilisation (Lutfiyya *et al.*, 2019). The previous study observed the inequalities in oral healthcare utilisation in Malaysia. Utilisation of oral healthcare was higher among females, married individuals, younger adults, those with higher education, those who had medical check-ups in the last 12 months, and

those with higher incomes (Tan *et al.*, 2021). This study found that Malay ethnicity and adults were more likely to utilise the VDSs.

The total attendance of primary and secondary schoolchildren was among the lowest in VDS. It would be due to the incremental dental programme in schools delivered by the School Dental Service (SDS) by the MOH. The group with the lowest utilisation rate was observed among the special needs group. People with disabilities have numerous challenges when it comes to dental care. People with disabilities may require special accommodations such as disabled parking and lifts. The unavailability of such facilities creates a significant barrier to routine dental treatment for those with disabilities (Hansen *et al.*, 2021). Although it was low, the need to serve this group still exists because this group will usually be affected more in terms of their health and oral health. Compared to the general population, adults with disabilities have a higher prevalence and severity of oral diseases (Beange, 1996). Due to the demand from the special needs group regarding their oral health care, it is important for the dental team to receive enough training to ensure this particular population receives adequate and satisfactory oral care. In all circumstances, the dental team is responsible for adapting in order to reduce oral healthcare barriers (Hansen *et al.*, 2021).

Various factors influence the utilisation of health facilities, especially oral healthcare facilities. Low utilisation of oral healthcare may also be related to a low perceived need for oral healthcare (Adunola *et al.*, 2019). However, this study did not focus on factors influencing the utilisation of VDSs. Improving the utilisation of oral healthcare by the public is critical. Appropriate interventions to reinforce existing programmes that promote regular and timely oral health check-ups are required to improve the utilisation of oral healthcare (Tan *et al.*, 2021).

Dental treatment delivered at the VDS

This study revealed that extracting permanent (n=6839, 65.6%) and deciduous (n=1338, 12.8%) teeth was the most frequent dental treatment conducted at VDSs. It was similar to the findings of the study conducted at a rural outreach dental clinic in Udo, Southern Nigeria. The most commonly administered treatment in that study was extractions (41.5%) (Okeigbemen & Nnawuihe, 2015). However, this study could not determine whether the teeth extraction was due to periodontal problems, caries, or other indications. It has been observed in this study that treatment on deciduous teeth was high as well, especially extraction (n=1338, 12.8%). These findings suggest the appropriateness of delegating the dental therapist in the VDS to cater the dental treatment to children besides the dentist.

The data collected from the participants for this study focused on curative treatment. Thus, it is not within the scope of this research to analyse the preventive treatment conducted in the VDSs. It is recommended that preventive treatments be considered in future research.

The Oral Health-Related Quality of Life of patients attending the VDS

The mean total score of S-OHIP for this study was 9.69 ± 7.64 . It was quite similar to the baseline of overweight/obese adolescents in Klang Valley, with a mean of 9.83 ± 6.68 (Tengku H *et al.*, 2021). It was lower than the study on an adult with a periodontal problem in Kuantan 14.73 ± 9.24 (Husain *et al.*, 2020) and the study on adults in Selangor 10.96 ± 8.81 (Saub *et al.*, 2005). However, it was higher compared to the study OHRQoL among residents of a care home in Terengganu at 6.28 ± 5.72 (Mohd *et al.*, 2020) and the study among adults living with HIV/AIDS at 8.8 ± 7.92 (Mohamed *et al.*, 2017). This variation in mean score could be attributed to population differences in their sociodemographic background and the sample size. A study in Canada found that children from low-income families had lower OHRQoL than children from high-

income families (Locker, 2007). A local study on Health-Related Quality of Life (HRQoL) of low socioeconomic status populations in Malaysia found that low QoL was associated with low household income (Puteh *et al.*, 2019).

Males reported a higher mean total S-OHIP score of 15.45 ± 7.66 than females 8.95 ± 7.35 . It differed from the result of a previous study based on the L-OHIP measure that claimed that oral problems had the same impact on both male's and females' quality of life (Saub & Locker, 2006). The previous study also stated that poor oral health had the most significant impact on the Indians' quality of life, in contrast to the latest study, which found that Malays (10.32 ± 7.75) had the highest impact among ethnic groups. However, both studies reported the same result which those with tertiary education (college or higher) had more impact than those with a lower education (secondary and lower). The different amounts and characteristics of samples between the previous study (n=214) and this study (n=97-without missing data) could cause dissimilarity and bias in the results.

Conclusion

The limited sample size of this study does not represent the population. However, this study revealed utilisation and OHRQoL among patients attending the VDSs in Selangor. Overall, the utilisation rate of VDSs in Selangor was low but increasing. Enhancement of the services and facilities of the VDSs is able to improve the situation.

Despite the low utilisation rate of the Selangor population to the VDSs, the OHRQoL of patients attending the VDSs was considered high. It is a valuable finding for the future allocation of oral healthcare services as it is apparent that even in the less-than-ideal condition of the current VDSs, the patients' OHRQoL was not heavily affected. It should be viewed as an opportunity to improve the current condition of the VDSs in terms of their physical condition with adequate human resources. Perhaps further studies with a

different approach, such as qualitative inquiries among the patients, need to be conducted to explore the factors influencing their utilisation rate of VDSs.

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Conflict of Interest

The authors declare that no conflict of interest exists.

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