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AWARENESS AND ATTITUDES OF TOOTH REPLACEMENT OPTIONS AMONG PARTIALLY DENTATE PATIENTS WITHIN BRUNEI-MUARA DISTRICT: A PILOT STUDY.

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ABSTRACT

Introduction: This pilot study aimed to assess awareness of tooth replacement options and attitudes towards tooth replacement of partially dentate patients within Brunei-Muara District of Brunei Darussalam. **Materials and Methods:** A cross-sectional sample of partially dentate patients attending government dental clinics in Brunei-Muara district was recruited to answer a questionnaire. The questionnaire consisted of nine close-ended and multiple-choice questions on sociodemographic information, and tooth replacement option awareness and attitudes. Collected data was analyzed using RStudio 1.2.1335 (for Windows) for descriptive statistics along with the chi-square test and fisher's exact test. **Results:** A total of 179 participants were recruited in this study. A large number (87.7%) of the patients were willing to replace their missing teeth. Most participants were aware of the removable prosthesis (80.0%), followed by implant-supported prostheses (41.9%) and tooth-supported bridges (25.1%). Younger aged participants and the ones with higher level of education were significantly more aware of tooth-supported bridges. Participants with higher education were also significantly more aware of implant-supported prostheses. Most of the participants reported that they gained information about tooth replacement options from Dental professionals. **Conclusion:** There were favourable responses towards attitude for tooth replacement among partially dentate patients in the Brunei-Muara district. Within the limitations of this pilot study, the findings can be used to gauge the treatment needs of the partially dentate patients in Brunei-Muara district of Brunei Darussalam.

Keywords: Awareness, Attitude, Brunei, Dental Prosthesis, Tooth loss.

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Keywords: Awareness, Attitude, Brunei, Dental Prosthesis, Tooth loss.

INTRODUCTION

Tooth loss is one of the main indicators for the population's oral health status for many countries.[1] Despite significant reduction in the prevalence of tooth loss globally, this oral condition continues to be a major concern among the population of Brunei Darussalam.[1, 2] Several studies have listed untreated dental caries and periodontal disease as two of the most common pathologies causing tooth loss.[1, 3] Moreover, the Global Burden of Disease 2015 reported that untreated dental caries and peri-

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odontal disease in the permanent dentition were among the most prevalent oral conditions contributing to tooth loss.[4]

Tooth loss can impact an individual's quality of life, as well as, affect an individual's social, mental, and emotional well-being.[5] Among the concerns for individuals with missing teeth are aesthetic and functional issues, such as mastication impairment.[6] Replacing missing teeth can help to restore a sense of normalcy to a state before the loss of dentition.[7] Moreover, tooth replacement can improve general health of individuals.[8] A study by Krall et al., suggested that prosthodontic intervention could assist with a healthy nutrient intake for those with missing teeth.[9] Several options are available for the replacement of missing teeth including removable or fixed dental prostheses, and dental implants.[5] Patient related factors such as, sociodemographic background and number of missing teeth may influence an individual's demands and expectations for dental prosthesis.[10] Complications can be encountered when there is a mismatch between the patient's expectation and the operator's vision for the treatment outcome.[11] This can usually be avoided by a thorough discussion during the consultation as well as gauging the patient's treatment needs.

In order to assess the treatment needs of the population, for logistics and planning, it would be beneficial to have information regarding the knowledge and views of tooth replacement among the population of Brunei. Currently, there is no such information available for Brunei Darussalam. Hence, the attitude and awareness towards tooth replacement at the outpatient dental clinics of Brunei-Muara district was assessed in this research. Hence the objectives of this study is to assess the awareness and attitudes towards tooth replacement and to observe the association between sociodemographic factors, tooth replacement awareness and attitudes among patients in Brunei-Muara District.

MATERIALS AND METHODS

Study design, population and sample

This pilot cross-sectional study was conducted at the government dental clinics within Brunei-Muara District of Brunei Darussalam. The participants in this study were recruited from five centres: National Dental Centre, Berakas Health Centre, Jubli Perak Sengkurong Health Centre, Pengiran Anak Puteri Hajah Muta-wakillah Hayatul Bolkiah Health Centre (Rimba) and Pengiran Anak Puteri Hajah Rashidah Sa'adatul Bolkiah Health Centre (Sungai Asam).

Adult (aged 18 years and above), partially dentate patients (excluding third molar) were included in the study. Individuals who were completely edentulous, unable to communicate, mentally disabled or physically handicapped were excluded from this study.

The proportion of partially dentate individuals within Brunei-Muara district is not known. Hence, the following formula was used to estimate the required sample size:

$$n' = \frac{NZ^2P(1-P)}{d^2(N-1)+Z^2P(1-P)}$$

Where
n' = Sample size with finite population correction,
N = Population size,
Z = Z statistic for a level of confidence
P = Expected proportion, and
D = Precision

A sample size of at least 385 was required to achieve precision (power) of 5% with an expected proportion of 50% at a 95% confidence level. Accounting for attrition and missing data, a 20% inflation was taken into

consideration, deriving a total minimum sample of 462. However, due to COVID-19 pandemic, resulting in difficulty in completing the study within the required time frame, the study was stopped early and the recruited study sample was analysed as a pilot study.

Data collection and Research instruments

All participants were informed about the objectives and methods of the study. The questionnaire consisted of nine close-ended and multiple-choice questions on sociodemographic information, as well as, awareness of tooth replacement options and attitudes. Items included in sociodemographic information were gender, age, education level, and ethnicity.

The self-explanatory questionnaire was adapted from a previous study conducted by Amjad et al.[5] The questionnaire was translated into a dual-language English and Malay version. The draft of the questionnaire was then pretested on five eligible patients, and was modified accordingly, before being used for this pilot study.

Statistical analysis

Collected data was analyzed using statistical tools, RStudio 1.2.1335 (for Windows, Microsoft Ltd, USA). Descriptive statistics i.e., frequencies and percentages were tabulated. Chi-square test and Fisher's exact test were utilized at a significance level of *p*-value less than 0.05 ($p<0.05$).

Ethical consideration

The questionnaire form was given to participants only after obtaining informed consent. Numerical codes were used to preserve participant's confidentiality. Ethical approval had been granted by the Institute of Health Sciences Research Ethics Committee (IHSREC) prior to the start of this study.

RESULTS

A total of 179 participants were recruited in this study. Fifty-seven percent (n=102) were female and 66.5% were over the age of 40 years. Majority (80.4%) were of malay racial ethnicity. About 50% of the participants had below secondary level education with only just under a quarter reported having attending tertiary education. The majority (n=157; 87.7%) of which showed a positive attitude towards tooth replacement (Table I). However, all the variables assessed were not statistically significant (p>0.05).

The remainder of participants reported that they would choose not to replace their missing teeth. Majority of them did not feel the need or had insufficient knowledge on the available options for tooth replacement (Table II). About 6 out of every 10 of the participants (58.7%) stated function as their reason to replace missing teeth. There was no significant difference (p>0.05) observed among the sociodemographic variables. Almost half of the participants (50.3%) appreciated that dental prostheses and natural teeth were not equivalent (Table II). Most of the participants (65.9%) did not have any experience with tooth replacement. The remainder have had received removable prostheses (29.6%), tooth-supported bridges (3.4%) and, implant-supported prostheses (3.4%) in the past (Table II). Eighty percent of the participants were aware of removable prostheses. Less than half of the participants were aware of implant-supported prostheses (41.9%) and about a quarter were aware of tooth-supported bridges (25.1%). Most of them gained information about tooth replacement from their dentist (60.0%), followed by friends/relatives (34.6%) and media exposure (28.5%). Almost all participants agreed that regular dental visits are necessary for their oral health (97.2%) (Table II).

Awareness for tooth-supported bridges was statistically significant when age

Table I: Attitude towards the replacement of missing teeth in relation to participants' demographic variables.

Do you think you need replacement when tooth/teeth are lost?		Total (n=179)		No (n=22)		Yes (n=157)		*P-value* [a]
Variables		**n**	**%**	**n**	**%**	**n**	**%**	
Gender	Male	77	43.0	12	15.6	65	84.4	0.244
	Female	102	57.0	10	9.8	92	90.2	
Age	<40	60	33.5	8	13.3	52	86.7	0.763
	>40	119	66.5	14	11.8	105	88.2	
Education Level	Below secondary education	88	49.2	15	17.0	73	83.0	0.0548
	Technical or Vocational/ BC GCE 'A' level/ Higher National Diploma	48	26.8	6	12.5	42	87.5	
	Tertiary Education	43	24.0	1	2.3	42	97.7	
Ethnicity	Malay	144	80.4	20	13.9	124	86.1	0.256[b]
	Non-Malays	35	19.6	2	5.7	33	94.3	

[a] Chi-square test for independence;
[b] Fisher's exact test

p=0.0260) and education levels (p=0.002) were correlated. Moreover, education levels (p<0.01) were statistically significant for awareness towards implant-supported prosthesis (Table III).

DISCUSSION

The present study was carried out to assess awareness and attitudes among partially dentate patients in Brunei-Muara government dental clinics towards tooth replacement op-

Table II: Attitudes and awareness of tooth replacement among participants.

Questions	Response options	n	%
Reason(s) for not replacing missing tooth/teeth? (n=22)	Do not feel it is needed	9	40.9
	Lack of knowledge about tooth replacement options	7	31.8
	Financial reasons	4	18.9
	Lack of Time	1	5.0
	Waiting queue	1	5.0
Participants reason for tooth replacement	Appearance	19	10.6
	Function	105	58.7
	Both	55	30.7
Participants opinions regarding equivalence of tooth replacement to natural teeth	Yes	39	21.8
	No	90	50.3
	Don't know	50	27.9
Previous experience with tooth replacement	Removable prostheses	53	29.6
	Tooth supported bridges	6	3.4
	Implant supported prostheses	6	3.4
	None	118	65.9
Participants awareness on tooth replacement	Removable prostheses	143	80.0
	Tooth supported bridges	45	25.1
	Implant supported prostheses	75	41.9
Source of information	Dentist	102	60.0
	Magazines/Newspaper	16	9.0
	Internet/Social media	51	28.5
	TV/Radio	17	9.5
	Friends/Relatives	62	34.6
	None	26	14.5
Participants awareness of the need for regular dental visits	Yes	174	97.2
	No	5	2.8

Table III: Participants' awareness on tooth replacement according to different variables

Variables	Tooth-supported bridges prosthesis	Implant supported prostheses
	P-value [a]	***P-value*** [a]
Gender	0.062	0.701
Age	***0.026***	0.728
Educational level	***0.002***	***<0.001***
Ethnicity	0.073	0.098

[a] **Chi-square test for independence**

tions. Most of the participants (87.7%) reported that they desired tooth replacement. This value is comparable to a study carried out in Sri Lanka, where 76.2% of participants showed similar attitudes towards tooth replacement.[12] Despite this, both studies failed to identify any significant differences with all the sociodemographic variables. The main reasons for not replacing teeth differed with most of the participants stating that they did not think it was necessary, in contrast with patients in India who stated financial constraints as the main reason.[13]

Majority of participants in this study rated function over aesthetics as a reason to replace lost teeth, regardless of their gender. This is similar to a study done by Amjad et al. in Pakistan.[5] However, they identified that gender was a significant factor ($p<0.05$) in the choice of replacement options. Amjad et al., reported that most female patients undergo tooth replacement due to aesthetic and functional concerns, while most male patients were concerned about function.[5] Conversely, Elias and coworkers found that male patients were more concerned with aesthetics over function.[14]

Among 179 participants, about half (50.3%) of the participants did not agree that prostheses and natural teeth were similar. However, most (65.9%) of these participants did not have any previous experience with tooth replacement. Hence, this opinion could be based on their notion of prostheses, the experiences of their family and friends, or information from media.

Most participants were familiar with removable prostheses (80.0%), compared to tooth-supported bridges (25.1%), and implant-supported prostheses (41.9%). These findings concur with other studies done in the Asian region.[12,15] However, a similar study in India had differing findings. They found that most of their participants were aware of tooth -supported bridges (40.5%), followed by removable prosthesis (20.1%) and implant-supported prostheses (15.6%).[16] This contrast could be due to differences in the healthcare systems and education standards among different nations.

Similar to a previous study, age and education levels were statistically significant for awareness towards tooth-supported bridges.[12] Younger participants as well as those with higher levels of education, were more aware of tooth-supported bridges. On the other hand, participants with higher education were significantly more aware of implant-supported prostheses. Therefore, this study was able to establish the level of education as an important factor for awareness towards tooth replacement in Brunei-Muara population of Brunei Darussalam.

Most of the participants obtained information on tooth replacement options from dentists (57%). According to a systematic review paper the findings are similar in many different countries.[17] However, a report by Kohli and colleagues from Malaysia stated that media was the primary source for information.[15]Overall, almost all of the participants (97.2%) agreed that in general, regular dental visits are necessary to improve oral health.

LIMITATIONS

There are several limitations identified in the present study. Due to time constraints from a COVID-19 pandemic, the ideal target sample size was not achieved. However, for a pilot study, sample size of 179 participants was more than enough to generate the above findings. The proportions of different ethnicities were not representative of the population, as the majority of the participants were Malays (80%). However, this percentage may be reflecting the proportion of the ethnicities who utilize the dental services in Brunei Muara district. A large proportion of the participants preferred the principal investigator to read the questions for them, which may have led to bias if their response was based on social ideals. Lastly, other sociodemographic variables, such as monthly income were not included in the study which may influence attitudes towards tooth replacement.

CONCLUSION

In conclusion, the majority of patients in Brunei-Muara were willing to replace their missing teeth. The participants were more aware of removable dentures, followed by implants and bridges as tooth replacement options available. The level of education was found to significantly affect participants' awareness towards different alternatives of tooth replacement. Chair side dental education was the major source of information among participants. Within the limitations of this pilot study, the findings can be used to gauge the treatment needs of partially dentate patients in Brunei-Muara district in Brunei Darussalam.

RECOMMENDATIONS

Since the results from this study shows a lack of awareness for tooth-supported bridges among the participants, greater effort may be treatment option. Further measures are needed to raise awareness about the importance of maintenance of their existing dentition and options for tooth replacement to the general public via mass media. Furthermore, a similar study can be conducted within an appropriate time frame to obtain the representative sample size.

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CONFLICTS OF INTEREST

There are no conflicts of interest in this study.

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BORANG KAJI SELIDIK

QUESTIONNAIRE FORM

Sila tuliskan atau tandakan (√) dimana sesuai jawapan pilihan anda.

Please write down or tick (√) where appropriate the answer of your choice.

1) **Demografi Peserta** *(Participant Demographic)*

a) **Jantina *(Gender*)**:

☐ Lelaki (*Male*)

☐ Perempuan (*Female*)

b) **Umur (*Age*)**:

☐ 18-24 tahun (*years)*

☐ 25-40 tahun (*years)*

☐ 41-60 tahun (*years)*

☐ 61 tahun keatas (*years and above)*

c) Tahap Pendidikan *(Education Level)*:

☐ Tiada Pendidikan formal (*No formal education*)

☐ Pendidikan Sekolah Rendah *(Primary School Education)*

☐ Pendidikan Sekolah Menengah (*Secondary School Education)*

☐ Teknikal atau vocational/ BC GCE 'A' level/ Diploma Tinggi Kebangsaan *(Technical or Vocational/ BC GCE 'A'level/ Higher National Diploma)*

☐ Pengajian Tinggi (Sarjana muda/ Sarjana/ Ijazah Doktor Falsafah) / *Tertiary Education. (Bachelor Degree/ Masters/ PhD)*

d) Kumpulan etnik/ *Ethnic group*

☐ Melayu/ *Malay*

☐ Kumpulan Asli (Iban, Murut dan lain-lain) / *Indigenous groups (Iban, Murut and etc)*

☐ Cina/ *Chinese*

☐ India/ *Indian*

☐ Yang lain-lain / *Others*

Sila nyatakan disini */ Please state here: ……*

2) Adakah anda fikir anda memerlukan penggantian apabila gigi / gigi hilang?
Do you think you need replacement when tooth/teeth are lost?

☐ Ya (*Yes*)

☐ Tidak (*No*)

Jika jawapan anda disoalan (2) adalah "Ya", anda TIDAK PERLU menjawab soalan (3) dan TERUS menjawab soalan (4).

If your answer in question (2) is "Yes", please SKIP question (3) and PROCEED to question (4).

3) Apakah sebab-sebab tidak perlu penggantian apabila gigi /gigi hilang? **(Anda boleh memilih lebih dari satu jawapan)**

BORANG KAJI SELIDIK

QUESTIONNAIRE FORM

Sila tuliskan atau tandakan (√) dimana sesuai jawapan pilihan anda.

Please write down or tick (√) where appropriate the answer of your choice.

What is/are the reason(s) for not replacing lost tooth/teeth? ***(You can choose more than one answer)***

☐ Kekurangan masa *(Lack of Time)*

☐ Atas sebab kewangan *(Financial reasons)*

☐ Tidak memerlukan *(Do not feel it is needed)*

☐ Kurang pengetahuan mengenai penggantian gigi *(Lack of knowledge about tooth replacement options)*

☐ Menunggu giliran *(Waiting queue)*

4) Pada pendapat anda, apakah sebab mengganti gigi? **(Anda boleh memilih lebih dari satu jawapan)**

In your opinion, what is/are the reason(s) for tooth replacement? ***(You can choose more than one answer)***

☐ Penampilan *(Appearance)*

☐ Fungsi, seperti mengunyah dan bercakap *(*Function, such as chewing and speaking*)*

5) Pada pendapat anda, adakah gigi gantian sama seperti gigi semula jadi?

In your opinion, is tooth replacement equivalent/similar to natural teeth?

☐ Ya *(Yes)*

☐ Tidak *(No)*

☐ Tidak tahu (Don't know)

6) Adakah anda mempunyai pengalaman dengan penggantian gigi yang disenaraikan dibawah?

Do you have any experience with listed tooth replacement options below?

☐ Gigi palsu yang boleh di tanggalkan (Removable Dentures)

☐ Gigi palsu jambatan (Bridge)

☐ Gigi palsu implan (Implant)

☐ Tiada pilihan di atas (None of the above)

7) Diantara penggantian gigi yang tersenarai dibawah, pilih yang anda ketahui? **(Anda boleh memilih lebih dari satu jawapan)**

Which of these listed tooth replacement options below are you aware of? ***(You can choose more than one answer)***

☐ Gigi palsu yang boleh di tanggalkan *(Removable Dentures)*

☐ Gigi palsu jambatan *(Bridge)*

☐ Gigi palsu implan *(Implant)*

☐ Tiada pilihan di atas *(None of the above)*

BORANG KAJI SELIDIK

QUESTIONNAIRE FORM

Sila tuliskan atau tandakan (√) dimana sesuai jawapan pilihan anda.

Please write down or tick (√) where appropriate the answer of your choice.

8) Bagaimanakah anda mendapatkan maklumat mengenai pelbagai gigi gantian?
How did you obtain information about any tooth replacement options?

☐ Dentist *(Doktor gigi)*

☐ Magazines/ newspaper *(Majalah/ Akhbar)*

☐ Internet/ Social media *(Internet/ Media sosial)*

☐ TV/ Radio *(TV/Radio)*

☐ Friends/ relatives *(Kawan/ Keluarga)*

☐ Tiada pilihan di atas *(None of the above)*

9) Adakah anda berfikir bahawa lawatan pergigian yang kerap diperlukan untuk semua orang?
Do you think that regular dental visits are needed for everybody?

☐ Ya *(Yes)*

☐ Tidak *(No)*