

## ORIGINAL PAPER

**Psychological Well-Being and Dental Health Experience  
of Adult Patients Attending Dental Clinic in  
Hospital Universiti Sains Malaysia**

*Cheryl Yip Ying Ling<sup>1</sup>, Zainab Mat Yudin<sup>1</sup>,  
Normastura Abdul Rahman<sup>1</sup>, Nor Asyikin Fadzil<sup>2</sup>*

<sup>1</sup>School Of Dental Sciences, Universiti Sains Malaysia (USM),  
Kelantan, Malaysia

<sup>2</sup>School of Medical Sciences, Health Campus, Universiti Sains Malaysia  
(USM), Kelantan, Malaysia

**Abstract**

**Background:** The aim of this study is to evaluate the psychological well-being that included depression, anxiety and stress in relation to dental caries experience among adult patients attending outpatient dental clinic. **Methods:** This was a cross-sectional study involving 106 adult patients who attended the outpatient dental clinic. Psychological well-being was evaluated using the Malay version of Depression, Anxiety and Stress Scales (DASS-21M) questionnaire. Clinical oral examination was conducted to determine the caries experience using the decayed, missing and filled teeth (DMFT) index. **Results:** The prevalence of moderate to severe symptoms for depression and stress was 5.7% (CI:1.2-10.1) and 6.6% (CI:1.8-11.4) respectively among the patients. Meanwhile for anxiety, the prevalence was much higher at 19.8% (CI:12.2-27.5). The median (IQR) of the caries experience was 7.0 (IQR=7). Despite of high prevalence of anxiety among the patients, however it was not common in those with higher caries experience. People with normal to mild anxiety symptoms level (9.0) have significantly higher caries experience ( $p=0.029$ ). There was no significant difference of depression ( $p=0.099$ ) and stress symptoms ( $p=0.452$ ) with the dental caries experience. **Conclusions:** Anxiety was prevalent among the patients attending dental clinic in Hospital Universiti Sains Malaysia. Even though, there was no statistically significant difference in comparison between severity of caries experience and symptoms of mental illness, mental health screening would be very beneficial to recognize and channel the silence sufferer to the early treatment of this stigmatize disorder.

**Keywords:** Anxiety, Dental Caries, Depression, Mental Health, Psychological Stress

## Introduction

The World Health Organization (WHO) describe mental health as “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” [1]. It includes our emotional, psychological, and social well-being. The psychosocial wellbeing affects how we think, belief, perceive, and react. A persistently deprived in mental health condition can lead to depression, stress and anxiety which later affect our general wellness and life productivity. There are various types of mental illness which result in poor mental health status such as major depression, anxiety disorder, bipolar disorder, schizophrenia and substances abuse. The consequences for the mental illness are risk for becoming violence and attempting suicide. According to the 2013 Global Burden of Disease Study, the predominant mental health problem worldwide is depression, followed by anxiety, schizophrenia and bipolar disorder [2].

Diagnostic and Statistics Manual of Mental Disorders 5 (DSM 5) described the symptoms of depression comprising of depressed mood, loss of interest, loss of energy and other symptoms related to it [3]. For diagnosis of major depression, the symptoms must be present most of the day for at least 2 weeks. These symptoms if not treated accordingly, will later lead to the deteriorating of daily life function. On the other hand, anxiety is a state of feeling worries, unease, fretfulness and nervousness which can also result in autonomic symptoms such as fast beating of heart, clammy hand or shaky hand. Stress is a state of feeling too much tension and pressure as a result from emotional, physical and

environment insult. It is normal for a person to have minimal and occasional symptoms of depression, anxiety and stress which precipitated by certain inconvenience conditions. Screening of mental health status is not routinely recommended however it can be performed in certain circumstances for example patients with high risk for mental illness such as patients with chronic illness, pregnancy and postpartum women. There are various available validated screening methods that look into the symptoms of mental health illness such as Patient Health Questionnaire-9 (PHQ-9), Beck Depression Inventory (BDI), Anxiety Screening Questionnaire (ASQ-15), Primary Care Posttraumatic Stress Disorder screening questionnaire (PC-PTSD), and Depression, Anxiety and Stress Scale (DASS) [4,5]. DASS is a screening tool that can assess the mental health symptoms for depression, anxiety and stress however it is not used for diagnosis of the mental disorders. It is used in various population group either with mental illness, medical illness and person without illness as a screening instrument and it measures the extent of three negative emotional conditions including depression, anxiety, and stress [6,7].

It is beneficial for the health professionals if they able to screen these mental health symptoms as mental illness is one of the major problems worldwide. Person with mental health symptoms or illness can be presented in any of health facilities either medical or dental. There was a meta-analysis evaluated the relationship between eating disorder and poor oral health. It was shown that patients with an eating disorder had higher dental caries scores and therefore teamwork between dental and medical practitioners was recommended as patients may not want to visit the psychiatrist or seeing a clinician [8]. A study in Finnish

adults revealed the significant relationship between depression and dental caries for adult aged 35 to 53 years old however depression was not related to the periodontal disease [9]. Anxiety disorder, on the other hand, was not related to dental caries. Likewise, depressive disorder had a relationship with dental caries based on the national survey data in Korea [10]. Bayopathi and Wang highlighted the influence of stress in periodontal disease and the psychological aspect of patient should be tackled in managing patients with oral problems [11].

The aims of this study were to evaluate prevalence of symptoms with moderate and above level of depression, anxiety and stress among patients attended outpatient dental clinic and compared the caries experience among them.

## Methods

A cross sectional study was conducted for a month on August 2017. It was conducted in the outpatient dental clinic in Hospital Universiti Sains Malaysia (Hospital USM), a tertiary hospital in north-eastern Malaysia. The sample size was calculated based on the proportion of stress patients attending orthodontic clinics in tertiary care hospital [12]. A total of 106 eligible patients had participated in this study which included those who were aged 18 years old and above while those who were illiteracy, diagnosed with severe mental illness such as schizophrenia, severe bipolar disorder and severe major depressive disorder were excluded as well as those who were unable to understand or speak due to various reason (eg dumb and mute) were excluded from the study.

In this study, we used a self-administered questionnaire which consist of two section.

The first section concerned a sociodemographic data on age, sex, ethnicity, job, total household monthly income, marital status, smoking status, occupation, educational level, and reason for dental visit. The second section of the questionnaires concerned the DASS-21M questionnaire. A validated Bahasa Melayu version of self-administered DASS-21 (DASS-21M) questionnaire adopted from Musa et al. (2007) to screen for symptoms of depression, anxiety and stress was utilised. DASS-21M had very good Cronbach's alpha values of 0.75, 0.74 and 0.79, respectively for depression, anxiety and stress subscales [13]. The BM DASS-21 is a quantitative measure of distress along the 3 axes which are 7 items of depression, 7 items of anxiety and 7 items of stress. The scores for depression are categorized into normal (0 to 4), mild (5 to 6), moderate (7 to 10), severe (11 to 13) and extremely severe (14 and above). The scores for anxiety are categorized into normal (0 to 3), mild (4 to 5), moderate (6 to 7), severe (8 to 9) and extremely severe (10 and above). The scores for stress are categorized into normal (0 to 7), mild (8 to 9), moderate (10 to 12), severe (13 to 16) and extremely severe (17 and above). DASS-21 is designed for screening of symptoms but not for diagnostic purpose which first developed by Lovibond and Lovibond in 1995.

Participants were briefed regarding the study and their consent were obtained. Participants were required to complete the questionnaires during that visit which took for about 10–15 minutes for each participant to complete the set of questions. Once completed, the participants were then taken to the dental examination room and seated on the dental chair for dental caries assessment. The examination were performed under a good lighting using a mouth mirror. A dental probe was used to remove food debris prior

to the assessment of dental caries. Caries experience were calculated using the index of DFMT developed by Klein et al. (1938) [14].

Data analyses were performed using Statistical Package for Social Sciences (SPSS), Version 22. Descriptive statistics of the variables were determined including frequency and percentage (%) for categorical variables (gender, smoking status, occupation, household income, marital status, education, reason for dental visit and DAS symptoms)) whereas mean and standard deviation (SD) or median and interquartile range (IQR) for the numerical variables (age and DFMT index). The prevalence was calculated at 95% confidence interval (95% CI). The comparison of caries experience (DMFT index) between normal/mild and

moderate/severe/extreme symptoms of depression, anxiety and stress was performed using Mann-Whitney test. The significant level was set at a p value less than 0.05.

## Results

The demographic characteristics of the participants are shown in Table 1. Majority of the participants were Malay ethnic (93%), young adult (73%), female (60%) and non-smokers (92%). The mean age of participants was 29.0±15.41 years. Majority of the participants had received formal education and almost 65% of them had completed university education. The main reason for dental visit was dental check-up (37%) and only 20% of them came for toothache.

**Table 1. Demographic Profiles of Participants (n =106)**

<b>Variables</b>	<b>n (%)</b>
<b>Gender</b>	
Males	42 (39.6)
Females	64 (60.4)
<b>Age</b>	
Mean Age	29.0 (±15.41) <sup>a</sup>
Young Adult (18 – 44)	77 (72.6)
Middle-aged adult (45-59)	20 (18.9)
Elderly (>60)	9 (8.5)
<b>Ethnicity</b>	
Malay	98 (92.5)
Chinese	3 (2.8)
Indian	2 (1.9)
Others	3 (2.8)
<b>Occupation</b>	
Government	28 (26.4)
Private sector	15 (14.2)
Student	40 (37.7)
Retiree	10 (9.4)
Unemployed	13 (12.3)
<b>Household Income(RM)</b>	
< 970	66 (62.3)
971-5228	36 (34.0)
>5228	4 (3.8)

**Marital Status**

Single	55 (51.9)
Married	51 (48.1)

**Education**

No schooling	1 (0.9)
Primary school	5 (5.7)
Secondary school	31 (29.2)
University	69 (65.1)

**Smoking Habit**

Non-smokers	97 (91.5)
Smokers	9 (8.5)

**Reason of Dental Visit**

Toothache	20 (18.9)
Dental Check-up	39 (36.8)
Prosthesis	13 (12.3)
Dental Trauma	1 (0.9)
Preventive Treatment	18 (17)

---

<sup>a</sup>Mean (Standard Deviation)

The prevalence of symptoms with moderate and above levels of depression, anxiety and depression were 5.6% (95% CI:1.2-10.1), 19.8% (95% CI:12.1-27.5) and 6.6% (95% CI:1.8-11.4). Table 2 shows the severity for symptoms of depression, anxiety and stress. Majority of the respondents had normal to mild symptoms. People with normal to mild

severity of DASS score, commonly neither experience any clinical symptoms of depression, anxiety or stress nor having any significantly impairment in life. However, attention must be given if they are having acute stress such as dental problem, where the problem can be overwhelming for them to have mental disorder.

**Table 2. Severity of DASS symptoms and caries experience among participants (n=106)**

DASS-21 category	n (n=106)	Percentage(%)
<b>Depression</b>		
Normal	91	85.9
Mild	9	8.5
Moderate	5	4.7
Severe	1	0.9
Extremely severe	0	0.0
<b>Anxiety</b>		
Normal	47	44.3
Mild	38	35.8
Moderate	13	12.3
Severe	4	3.8
Extremely severe	4	3.8
<b>Stress</b>		
Normal	93	87.7
Mild	6	5.7
Moderate	7	6.6
Severe	0	0.0
Extremely severe	0	0.0
<b>Caries Experience (DFMT index)</b>		<b>Median score (IQR)</b>
Total DMFT		7.0 (7) <sup>a</sup>
Decayed		1.0 (4) <sup>a</sup>
Missing		1.0 (3) <sup>a</sup>
Filled		2.0 (3) <sup>a</sup>

<sup>a</sup>Median (Interquartile Range)

The median of caries experience (DFMT index) among respondents for total DMFT score, decayed, missing and filled were 7.0, 1.0, 1.0 and 2.0 (as shown in Table 2). We compared the dental caries experience in patients with normal/mild symptoms and moderated to extremely severe symptoms for depression, anxiety and stress. Table 3

shows the comparison between caries experience and moderate/severe/extremely severe symptoms of depression, anxiety and stress. The significantly difference in caries experience between normal/mild and moderate/severe/extremely severe symptoms was found only in patients with anxiety symptoms (p value= 0.029).

**Table 3. Comparison of caries experience (DMFT index) between normal/mild and moderate/severe/extreme symptoms of depression, anxiety and stress.**

Variable	Median (IQR)		z statistic	p value <sup>a</sup>
	Normal – Mild symptoms	Moderate – Extremely Severe symptoms		
DFMT Score for:				
Depression	7.5 (7)	1.5 (13)	-1.651	0.099
Anxiety	9.0 (10)	5.0 (6)	-2.184	0.029
Stress	7.0 (7)	7.0 (9)	-0.752	0.452

<sup>a</sup>Mann-Whitney test-Normality is checked

## Discussion

Majority of the participants in this study were Malay as approximately 98% of Kelantan population is Malay ethnic [15]. We observed the participants were mainly young adults and students. Our study site was a tertiary teaching hospital and a public institutional. Patients attended an outpatient dental clinic also comprised of students studying in this institution.

In this study, the overall symptoms for anxiety were the highest among the participants (55.7%) however most of them were having mild symptoms. It was recorded about 64.8% of patients attended primary care setting exhibited anxiety symptoms [16]. Anxiety symptoms includes feeling worries, restlessness, palpitations, difficulty in concentrating and feeling agitated. Anxiety disorder occurs in the state of excessive symptoms resulting in impairment of daily activities and function. A global prevalence of anxiety disorder in 2015 was 3.6% [17]. An anxiety prevalence ranging from 3.6% to 25%; particularly in women (5.2–8.7%) and young adults (2.5–9.1%) were evaluated in a systematic review [18].

About 19.8% had clinically significant symptoms (moderate to extremely severe) of anxiety in this current study. Patients attended the outpatient clinic were more likely to exhibit anxiety symptoms compared to people in the community for example one study conducted in a community in Malaysia revealed a prevalence of anxiety about 8.2% [18]. In the community study, the anxiety symptoms were evaluated using Generalized Anxiety Disorder 7 (GAD 7) questionnaire. Even though the anxiety symptoms in our study was much higher, the possibility of overlapping with the dental anxiety symptoms were unlikely since the items used in the anxiety subdomains are general symptoms of anxiety in the past two weeks. In assessing dental anxiety, the scales used are more specified to a dental related procedure such as drilling, scaling and local anaesthetic injection. The prevalence of dental anxiety reported in several studies using the Modified Dental Anxiety Scale (MDAS) were ranging from 26% to 58% [25-28].

Similar study among patients undergoing orthodontic treatment at the dental outpatient clinic in Pakistan was evaluated revealed the symptoms for depression, anxiety and stress were 31.6%, 36.8% and

41.1% regardless the severity of symptoms. However in that study, the DASS-42 were used [12]. A shorter, 21-item version of the DASS (DASS-21), is correspond with the longer, 42-item version (DASS-42) and have similar reliability with good internal consistency for each item in detecting symptoms of depression, anxiety and stress [20-22]. Non-orthodontic patients in an outpatient dental clinic setting had elicited lower prevalence in symptoms of depression and stress compared to orthodontic patients. It is our surprised to know the overall anxiety symptoms among outpatient dental clinic much higher than orthodontic patients. Both depression and stress were expected to be higher among orthodontic patients compared to an outpatient dental patient. As we know that orthodontic patients included those with teeth and jaw malposition that would contribute to the facial appearance of the individual. This self-appearance may contribute to the different state of emotional feeling.

Depression, anxiety and stress among patients with diabetes attending primary care clinic were evaluated using a similar tool as our study revealed 26.6%, 40%, and 19.4% had symptoms for depression, anxiety, and stress [23]. Patients with chronic illness such as diabetes mellitus exhibited more symptoms for depression and stress. However, anxiety symptoms were much higher in dental outpatient patients compared to diabetic patients. The prevalence of depression among adult community conducted in one of the state in Malaysia using Patient Health Questionnaire (PHQ) revealed 10.3% of adults [24]. It is not much difference with our study which was about 14.2% of patients had depressive symptoms and mostly mild symptoms.

Even though the anxiety symptoms in our study was much more higher, the possibility

of overlapping with the dental anxiety symptoms were unlikely since the items used in the anxiety subdomains are general symptoms of anxiety in the past two weeks. In assessing dental anxiety, the scales used are more specified to a dental related procedure such as drilling, scaling and local anaesthetic injection. The prevalence of dental anxiety reported in several studies using the Modified Dental Anxiety Scale (MDAS) were ranging from 26% to 58% [25-28].

Caries experience was measured by DMFT index. The median index for total DMFT among participants was 7.0 (IQR7.0). A survey done in public dental clinic in Australia revealed the mean DMFT index of 14.6 (95%CI:13.4-15.8) [29]. Majority of industrialized countries elicited a higher DFMT index compared to developing countries such as Africa and Asia which had lower scores [30]. The mean age for our participants was 29.0 ( $\pm$ 15.41) years. A survey in Malaysia showed at the age of between 25 to 34 years old the mean DFMT score was 6 to 8 [31]. The overall index of DMFT in our study was not much different from previous studies. In our study, we compared the caries experience with normal/mild symptoms of DAS and the caries experience in patients with moderate/severe/extremely severe symptoms of DAS. There was a significant difference between caries experience in normal/mild and moderate/severe/extremely severe anxiety symptoms ( $p = 0.029$ ) however the results were not significantly difference when compared in mild/normal and moderate/extremely severe symptoms of depression ( $p = 0.099$ ) and stress ( $p = 0.452$ ). It was also observed in the participants with normal/mild symptoms depression and anxiety had a higher level of DMFT index. Unexpectedly, the participants with normal/mild anxiety symptoms have a

higher caries experience compared to moderate/severe/extremely severe anxiety symptoms and significantly differs. Furthermore, a study among Finnish adults did not show any significant association between anxiety disorder and dental caries [9]. In similar study also demonstrated the association between depression and dental caries which in our study there was no difference in dental caries among participants with depressive symptoms. A study among schoolchildren aged 9 to 12 years in Japan by Shimura et al. (1983) showed children with more high anxiety tend to have more dental caries [32].

### Conclusion

In conclusion, anxiety was prevalent among the patients attending the dental clinic in Hospital USM. Even though, there was no significant difference in comparison between severity of caries experience and symptoms of mental illness, mental health screening would be very beneficial to recognize and channel the silence sufferer to the early treatment of this stigmatized disorder.

### Strength and Limitation

This study highlighted that patients attending the outpatient dental office had some degree of psychosocial issue. The limitation of this study was other factors contributing to caries experience were not being evaluated. Recruitment of more patients might contribute to a significant findings and should be done in future study.

### Acknowledgements

The authors would like to express their gratitude to Universiti Sains Malaysia for providing research funding (Grant no.304/PPSG/6315039), School of Dental Sciences, Universiti Sains Malaysia).

### Competing Interests

We declare there is no financial and personal relationship with other people or organizations that could inappropriately influence the research.

### References

- [1] World Health Organization, Geneva, Department of Mental Health and Substance Dependence, Noncommunicable Diseases and Mental Health, Investing in Mental Health; 2003:7.
- [2] Steel Z, Marnane C, Iranpour C, Chey T, Jackson JW, Patel V. et al. The global prevalence of common mental disorders: A systematic review and meta-analysis 1980–2013. *Int J Epidemiol*; 2014;43:476-493.
- [3] American Psychiatric Association, Diagnostic and statistical manual of mental disorders . 5th ed. American Psychiatric Publishing; 2013.
- [4] American Academy of Pediatrics. Addressing Mental Health Concerns in Primary Care: A Clinician's Toolkit; revised January 2012.
- [5] Rinad S, Beidas, Rebecca E, Stewart, Lucia Walsh, Steven Lucas, Margaret Mary Downey, Kamilah Jackson et al. Free, brief, and validated: Standardized instruments for low resource mental health settings. *Cogn Behav Pract*. 2015 February 1;22:5–19.
- [6] Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the

- Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour research and therapy*. 1995;33:335-343.
- [7] Luke Parkitny, James McAuley. The Depression Anxiety Stress Scale (DASS). *Journal of Physiotherapy*; 2010;56.
- [8] Steve Kisely, Hooman Baghaie, Ratilal Laloo, Newell W. Johnson. Association Between Poor Oral Health And Eating Disorders: Systematic Review And Meta-Analysis. *The British Journal of Psychiatry*. 2015;207:299–305.
- [9] Delgado-Angulo EK, Sabbah W, Suominen AL, Vehkalahti MM, Knuuttila M, Partonen T et al. The Association Of Depression And Anxiety With Dental Caries And Periodontal Disease Among Finnish Adults. *Community Dentistry And Oral Epidemiology*. 2015 Jul 1.
- [10] Se-Jin Kim, Yun-Hui Lee. The Mental Health Influence to Dental Caries in Adults. *Int J Clin Prev Dent*. 2016;12:51-56.
- [11] Boyapati L, Wang HL, The Role Of Stress In Periodontal Disease And Wound Healing. *Periodontology 2000*. 2007;44:195-210.
- [12] Rashid H, Hussain SS. Prevalence Of Depression, Anxiety And Stress Among Orthodontics Patients Visiting A Tertiary Care Hospital, Pakistan. *International Journal of Dental Clinics*. 2014;6.
- [13] Musa R, Fadzil MA, Zain Z. Translation, Validation and Psychometric properties of Bahasa Malaysia version of the Depression Anxiety and Stress Scales (DASS). *ASEAN Journal of Psychiatry*. 2007;8:82-89.
- [14] Klein H, Palmer CE, Knutson JW. Studies On Dental Caries: Dental Status And Dental Of Elementary Schoolchildren. *Public Health Rep*. 1938; 53:751–765.
- [15] Kelantan State Government [Internet] [Cited 2019 Aug 8]. Available from: [http://www.data.gov.my/data/ms\\_MY/organization/kelantan-state-government](http://www.data.gov.my/data/ms_MY/organization/kelantan-state-government).
- [16] Walters K, Rait G, Griffin M, Buszewicz M, Nazareth I. Recent Trends in the Incidence of Anxiety Diagnoses and Symptoms in Primary Care. *PLoS ONE*. 2012;7(8): e41670.
- [17] Depression and Other Common Mental Disorders: Global Health Estimates. Geneva: World Health Organization. 2017;10.
- [18] Olivia Remes, Carol Brayne, Rianne van der Linde and Louise Lafortune. A systematic review of reviews on the prevalence of anxiety disorders in adult populations. *Brain and Behavior*. 2016;6(7).
- [19] Kader Maideen SF, Mohd. Sidik S, Rampal L, Mukhtar F. Prevalence, Associated Factors And Predictors Of Anxiety: A Community Survey In Selangor, Malaysia. *BMC Psychiatry*. 2015;15:262.

- [20] Brown TA, Chorpita BF, Korotitsch W, Barlow DH. Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. *Behaviour research and therapy*. 1997;35:79-89.
- [21] Henry JD, Crawford JR. The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British journal of clinical psychology*. 2005;44:227-239.
- [22] Page AC, Hooke GR, Morrison DL. Psychometric properties of the Depression Anxiety Stress Scales (DASS) in depressed clinical samples. *British Journal of Clinical Psychology*. 2007; 46:283-297.
- [23] Tan KC, Chan GC, Eric H, Maria AI, Norliza MJ, Oun BH, Sheerine MT, Wong SJ, Liew SM. Depression, anxiety and stress among patients with diabetes in primary care: A cross-sectional study. *Malays Fam Physician*. 2015 Aug 31;10:9-21.
- [24] Kader Maideen SF, Mohd. Sidik S, Rampal L, Mukhtar F. Prevalence, Associated Factors and Predictors of Depression among Adults in the Community of Selangor, Malaysia. *PLOS ONE*. 2014;9(4).
- [25] Saatchi M, Abtahi M, Mohammadi G, Mirdamadi M, Binandeh ES, The Prevalence Of Dental Anxiety And Fear In Patients Referred To Isfahan Dental School, Iran. *Dental Research Journal*. 2015;12:248.
- [26] Sitheeque M, Massoud M, Yahya S, Humphris G. Validation Of The Malay Version Of The Modified Dental Anxiety Scale And The Prevalence Of Dental Anxiety In A Malaysian Population. *Journal of Investigative and Clinical Dentistry*. 2015; 6:313-320.
- [27] El Faki A K, Awooda EM. Dental Anxiety Prevalence and Associated Factors among Patients Attending the Academy Dental Teaching Hospital–Khartoum, Sudan. *American Journal of Medical Sciences and Medicine*. 2016;4:82-86.
- [28] Fayad MI, Elbieh A, Baig MN, Alruwaili SA. Prevalence Of Dental Anxiety Among Dental Patients In Saudi Arabia. *Journal of International Society of Preventive & Community Dentistry*. 2017;7:100.
- [29] Brennan DS, Spencer A.J. Changes In Caries Experience Among Australian Public Dental Patients Between 1995/96 and 2001/02. *Australian and New Zealand Journal of Public Health*. 2004;28:542-548.
- [30] Petersen PE, Bourgeois D, Hiroshi O, Estupinan-Day S, Ndiaye C. The Global Burden of Oral Diseases and Risk to Oral Health. *Bulletin of the World Health Organisation*, September. 2005;83:661-669.
- [31] Ministry of Health Malaysia, Oral Health Division, National Oral Health Plan For Malaysia 2011-2020. 2011 February;4.

[32] Shimura N, Nakamura C, Hirayama Y, Yonemitsu M. Anxiety And Dental Caries. Community Dent

Oral Epidemiol. 1983 Aug 11;224-7.

**Corresponding Author**

Dr Zainab Mat Yudin,  
School of Dental Sciences, Health Campus,  
Universiti Sains Malaysia (USM),  
16150 Kubang Kerian, Kelantan,  
Malaysia

**Tel:** +6097671187 / 01110622974

**Email:** drzainab@usm.my