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## The Effects of Education and Gender based Behaviour towards Oral Health in a Malaysian Town.

**Objective:** The purpose of this study was to determine the effects of educational level on the oral health status and more likely the gender based change of behaviour in adult persons. **Methodology:** Forty two (42) subjects amongst 19 males (45.2%) and 23 females (54.8%) participated in the study. The mean age was 35 years. All subjects under the age of 20 years were excluded to avoid scoring the deepened sulci associated with eruption of 3rd molar teeth. The oral health behaviours were targeted using a questionnaire while the oral health status was determined through oral examination using pre-determined indices. **Statistical analyses** were done using SPSS soft ware. **Results:** It was found there was a great influence of education on the oral health of both male and female subjects while just gender had no role to assess the said objective. Furthermore, education level had a significant association with the use of fluoridated toothpaste, grinding of teeth during sleep and limitations in mouth opening. Moreover, upon oral examination a significant link was found between the educational level and oral hygiene status measured by Simplified Oral Hygiene Index (OHI-S). **Conclusion:** It can be concluded that oral health status is closely linked with education regardless of gender.

**Keywords:** Oral Health, Education, Gender, Gingiva, Oral Hygiene, Oral Examination

### INTRODUCTION

Oral health is concerned with maintaining the health of orofacial complex including teeth, gums and tissues of the face and head that surround the mouth. Diseases and conditions affecting this complex may lead to tooth loss, periodontal diseases, diminished salivary functions, orofacial pain, oral and pharyngeal cancers, mucosal diseases and functional limitations of mouth opening and movements. These oral impairments can diminish one's social interactions, self-esteem and self-image and have dramatic effects on a person's quality of life. Despite great achievements in oral health of populations globally, problems still remain in many communities all over the world especially among under-privileged groups in developed and developing countries. Oral diseases, particularly dental caries and periodontal diseases, have historically been considered the most powerful oral health burdens globally {1}. Many oral diseases have multifaceted aetiologies like personal hygiene, behavioural, hormonal and genetic factors and thus are chronic and have long term effects {2, 3}. These diseases may give an indication of other additional health problems in the body. Many studies revealed a relationship between oral health and heart disease, stroke, low birth-weight babies, and respiratory problems {4, 5}. On the other hand, many systemic diseases have oral manifestations that increase the risk of oral disease {6}. Although oral diseases are caused by multiple factors, some researchers suggested that gender and education level are among the main factors {7, 8}. Gender is a critical factor of oral health status that determines the differential power between men and women. It affects the socioeconomic determinants of oral health and lives, social position, status and treatment in society and their susceptibility and exposure to specific oral health risks {9}. Hormonal fluctuations in the female patients may alter the status of periodontal health, such changes may occur during puberty, the menstrual cycle, pregnancy, or menopause. Changes may also be associated with the use of oral contraceptives and certain systemic conditions more

notable among women such as diabetes {10, 11}. These hormonal effects are thought to cause increased tooth mobility and periodontal diseases, mainly due to the influence of oestrogen. This leads to gum inflammation, oedema, sensitivity, and a tendency to bleed easily {12}. It had been concluded that for most healthy women without the predisposition to oral diseases, the negative influence of the changes in estrogen and progesterone levels can be controlled by additional plaque control, and these women should not be considered to be at increased risk of periodontal disease. Recent data suggested that this finding may be related to gender-dependent genetic predisposing factors or other socio-behavioural factors {13, 14}. The effects of education level on the incidence of oral diseases have been assessed in many studies {15, 16} and such studies revealed different education level may contribute to a difference in knowledge, attitude and response of the patient to dental problems. One of the possible reasons that oral health status for educated people is better than others because these groups of people are more informed about their oral health needs and are also more likely to seek dental treatment. In addition educated persons are expected to be able to afford dental service and should have better access to adequate dental care, and have better than average oral health habits {17}. They are also more likely to recognize oral disease compared to poorly educated individuals. The same results were reported by Tanni et al. {18} and Kumar & Green {19}. They concluded that the incidence of oral disease has been positively correlated with lower educational achievement and lower socio-economic status. It has also been shown that people with lower educational levels are disadvantaged in respect to access to dental services. Problem-oriented dental visiting also varies significantly by education level. As education level increases the prevalence of people reporting a visit to the dentist becomes higher. Furthermore, dental insurance coverage increases significantly with level of education as university graduates were significantly more likely to have dental insurance than those who had completed trade

certificate/apprenticeship {20,21}. Several studies have also reported that a lower education level is associated with negative perception of oral health in the elderly {22, 23}. A lower education level might lead to bad oral health behaviour in the elderly. A higher frequency of denture cleaning was significantly associated with a higher educational level. These findings indicate that education level should be considered when assessing risk, and planning appropriate preventive measures {24}. This study was conducted to determine the effects of education level and gender based behaviour towards oral health among patients attending the clinical centre of the Advanced Medical and Dental Institute (AMDI) in Penang.

## MATERIAL AND METHODS

**Study Population:** The population of interest were adult subjects attending AMDI dental clinic, Universiti Sains Malaysia (USM) between the months of February and May 2008. All patients under the age of 20 years were excluded to avoid scoring the deepened sulci associated with eruption {25}. In this study, informed consent was taken from all the subjects to participate in this study.

**Oral Health Questionnaire:** A self-administered questionnaire asking for relevant demographic variables as well as behaviours associated with oral health status was constructed. It was designed to have a single response for each question. This questionnaire was then pre-tested and discussed for clarity and later modified as necessary.

**Oral Health Assessment:** Oral examination included assessment the condition of the dentition and the status of oral hygiene. The indices which were used in this study are approved by the WHO namely:

- Dentition Status with respect to caries incidence (DMFT, decayed, missing, filled teeth).
- Oral Hygiene Status (OHI-S).

**Statistical Methods:** Statistical analysis was carried out using SPSS (version 12.0 Chicago, IL). The differences between gender and education level with regard to the status of each dental health knowledge item and oral health behaviour were analyzed using the Fisher's Exact Test. The difference between categorical variables (DMFT and OHI-S) with regard to dental health knowledge score was analysed using Mann-Whitney U- test.

**Results and Discussion:** The subjects consisted of 42 patients who fulfilled the inclusion criteria. 19 (45.2%) were males while 23 (54.8%) were females, with a mean age of 35 years. Of the total subjects, 15 (35.7%) had secondary education, 26 (61.9%) had college/university education while one patient (2.4%) did not provide the information.

**Gender:** The effects of gender on oral health status have been demonstrated by many researchers {11, 26, 27}. They suggested that the difference in disease prevalence may be attributed to the psychological and physiological differences among male and female that are naturally present. These differences arise from hormonal changes and drugs such as contraceptives {28}. Furthermore it may also be related to the hereditary factors and certain habits {14}. Other studies showed an association between gender and attachment loss in adults with women having higher prevalence and severity of periodontal destruction than men {29, 30}. Gender is also related to problems other than dental caries and periodontal diseases such as bruxism and limitation of

opening {31}. Although the effect of gender on oral health status has been proven by other researchers, but in the current study we could not find any significant relationship with most of the tested variables. These limitations might arise from the limited number of patients.

**Education Level:** Lower educational levels will subsequently relate to a lack of knowledge, beliefs, and culture in the support of oral health and can lead to many oral health problems. Prevention of these problems depends on education and health promotion strategies as well as early diagnosis, proper oral hygiene, diet control measures, and smoking cessation {32, 33}. The relationship between educational levels and the use of fluoridated toothpaste is shown in **Table I** which was significant ( $p = 0.033$ ). This is in agreement with Grossi & Genco {6} and Bratthall et al. {34}. They suggested that highly educated people are more aware that fluoride increases the hardness of the tooth enamel, thus making it less acid soluble. The relationship between educational levels and grinding the teeth during sleep is shown in **Table II**. This was also significant ( $p = 0.006$ ). **Table III** shows the relationship between educational levels and limitations in opening or moving the lower jaw, which similarly showed a significant association ( $p = 0.043$ ). Our results show that grinding of teeth during sleep and limitations in opening or moving the lower jaw were higher among the educated people. This may be due to the more stressful life experienced by the highly educated people attributed to the more demanding job that they have. This explanation is in agreement with a study by Sutcliffe which reported a similar trend {35}. **Table IV** compares the educational level with oral indices (DMFT and OHI-S), out of which only OHI-S showed a significant association with education level ( $p = 0.015$ ). The significant association that has been found between education level and the oral hygiene index (OHI-S) is in parallel with Paulander et al {24} who examined the effect of education level on oral health status. It was shown in their study that the education level influences the oral conditions and hence, they suggested that it is an important factor to be considered in assessing the risk and in planning appropriate preventive measures. Moreover, our study showed a significant fact despite improved oral hygiene level in better educated people, there was less association between education level and the dentition status. This might be due to the level of dental awareness that only increased after the subjects had received a better education; whereas, the DMFT index was influenced by past caries experience when the awareness was still low. This is in contrast to other studies {18, 19} which revealed that the prevalence of oral diseases is different between patients with secondary education and those with college/university education.

**Conclusions:** Based on the results of our study, the following conclusions are established:

- Gender has no association with the variables assessed in the questionnaire and oral examination.
- Education level has associations with the oral hygiene status, limitations in the opening of the jaw, night grinding and the use of fluoridated tooth paste.

**Table I.** Association between education level and type of tooth paste

Variable	n	Education level		P-value
		Secondary Freq (%)	College/University Freq (%)	
With Fluoride	32	10 (66.7)	22 (84.6)	0.249
Without Fluoride	3	1 (6.7)	2 (7.7)	
Don't Know	6	4 (26.7)	2 (7.7)	

<sup>a</sup> Fisher's Exact Test

**Table II.** Association between education level and grinding of teeth during sleep

Variable	n	Education level		P-value
		Secondary Freq (%)	College/University Freq (%)	
Yes	9	7 (46.7)	2 (7.7)	0.006
No	32	8 (53.3)	24 (92.3)	

<sup>a</sup> Fisher's Exact Test

**Table III.** Association between education level and limitations in opening jaw

Variable	n	Education level		P-value
		Secondary Freq (%)	College/University Freq (%)	
Yes	3	3 (20.0)	0	0.043
No	32	12 (80.0)	26 (100.0)	

<sup>a</sup> Fisher's Exact Test

**Tables IV.** Association among education level, DMFT and OHI-S.

Variable	Education level		P-value
	Secondary N=15 Median (IQR)	College/University N=26 Median (IQR)	
DMFT	6 (9)	7 (5.5)	0.924
OHI-S	1.16 (2)	0.66 (0.58)	0.015

<sup>a</sup> Fisher's Exact Test**ACKNOWLEDGMENTS**

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