



Correlation Between Socioeconomic Status (SES) and Oral Hygiene Status among PIDC Patients

Pramod Machani¹, Philip Pradeep^{1*}, Siow Rachel², Annie Khor Yuan Ning² and Manasvini Menon²

¹Lecturer, Penang International Dental College (PIDC), Butterworth, Malaysia

²Dental Health Officer, Ministry of Health, Malaysia

*Corresponding Author: Philip Pradeep, Lecturer, Department: Conservative Dentistry and Endodontics, Penang International Dental College (PIDC), Butterworth, Malaysia.

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Abstract

Background: This study aims to investigate the relationship between socioeconomic status (SES) and oral hygiene status (OHI-S) among the patients visiting Penang International Dental College (PIDC).

Methodology: A cross-sectional survey involving 107 samples was selected using convenience sampling. The survey was carried out by using a pre-formulated questionnaire and OHI-S. Statistical analysis is done using descriptive statistics, Spearman's correlation analysis, ANOVA, t-Testing, and hierarchical regression analysis.

Results: The results show that 37.4% of the respondents had poor OHI-S, 45.8% had fair OHI-S and 16.8% of the respondents exhibited good OHI-S. A strong and positive correlation between SES and OHI-S with $r = 0.659$ and $p = 0.00$ was shown.

Conclusion: Overall, the majority of the respondents have satisfactory oral hygiene. The result demonstrated a positive correlation between SES and OHI-S. Further research is needed to identify other reasons for the disparity in oral hygiene level besides income and education.

Keywords: Socioeconomic Status (SES); Oral Hygiene Status; Simplified Oral Hygiene Index (OHI-S)

Introduction

Globally, oral hygiene has become an important topic. Many new technologies and useful methods have been discovered to improve oral hygiene because good oral hygiene behaviour is needed to maintain good oral health. However, many researches had provided evidence showing one's socioeconomic status affects their oral hygiene status.

With the rapid growth of the economy, the socioeconomic status of Malaysians now is higher than before. SES in Malaysia is divided into Bottom 40 (B40), Middle 40 (M40) and Top 20 (T20) is ranked according to their household income. The rise in socioeconomic status also contributes to the improvement of oral hygiene status. This is because individuals now have better accessibility to oral healthcare and also increased awareness of oral health. However, inequalities in socioeconomic standing underlie several health disparities within the world, including oral health. Occupation, financial gain and education square measure as such connected and often function live for each other.

In general, the population that suffers the worst oral hygiene also are the people who have lower income and the lowest education. Higher income allows one to afford higher housing and allow inflated access to dental care. At the same time, a high level of education increases the chance to have interaction in oral health-promoting behaviours. They have increased levels of oral health knowledge and a more positive attitude which help them to cultivate a better oral health practice [1]. On the other hand, the poor are unable to benefit from the oral healthcare facilities due to limitation in accessibility and lack of awareness. Additionally, variations in financial gain and employment of parents generate inequalities in oral health status of youngsters [2]. Habits are often shaped since young. Poor families give less emphasis on oral hygiene causing lack of cultivation of oral hygiene awareness since young. Thus, children from the lower SES families tend to have poor oral health [3]. This indeed is a problem because poor oral health is detrimental to the quality of life.

The World Health Organization (WHO) gives great importance in evaluating and improving the quality of life of all regardless of their socioeconomic status [4]. It is with this in mind that the researchers are set to determine the oral hygiene status of various socioeconomic groups.

Aims and Objectives

1. To investigate the relationship between socioeconomic status (SES) and oral hygiene status (OHI-S) among the patients visiting PIDC.
2. To examine the oral hygiene status of various social economic strata among patients visiting PIDC.
3. To determine the existence of any significant difference between the oral hygiene levels of the 3 main communities in Malaysia, namely, Malays, Chinese and Indians.
4. To determine the existence of any significant difference between the oral hygiene levels of males and females.
5. To determine if all the three variables of education, occupation and household income have significant predictive capacities towards oral hygiene levels.

Materials and Methods

A cross-sectional survey was done to find out the correlation between the Socioeconomic status (SES) and oral hygiene of the patients visiting PIDC.

The study was conducted in the form of a survey through which the researchers attempted to find out the socioeconomic status, education level and occupation of the respondents via questionnaire followed by a clinical examination where the Simplified Oral Hygiene Index (OHI-S) was recorded as the oral hygiene status of the respondents.

A sample of 107 patients visiting the Department of Oral Medicine and Radiology and Department of Periodontology of PIDC were selected via convenience sampling. The samples of the study are selected according to the inclusion criteria decided prior to the commencement of the research where participants must be a Malaysian citizen, aged 18 years and above, systemically healthy, and willing to give informed consent. The exclusion criteria followed in selecting samples are incomplete survey forms, individuals with intellectual disabilities and medically compromised individuals.

A letter of introduction was given to the patient and informed consent is obtained prior to the research being carried out to formalize the process of collecting the data. A set of questionnaires consisting of seven (7) questions prepared to assess the details about the respondents' socioeconomic status were given to the participants prior to dental examination.

A clinical examination was then conducted and the Simplified Oral Hygiene Index (OHI-S) was recorded as the oral hygiene status of the respondents. The clinical examination was carried out by the investigators in the clinic with strict adherence to the infection control protocol. A mouth mirror and a No. 23 explorer is used along with proper illumination.

The data collected was analysed using the Statistical Program for Social Sciences (SPSS). The confidence level was set at 95% with significance level of 0.05.

Descriptive statistics, Spearman's Correlation Analysis, ANOVA test, t-test and Hierarchical regression analysis were used to answer the research questions.

Results

Based on table 1, there were 59 females and 48 males, aged 21 to 66 years old in the sample which comprises respondents who are patients of PIDC. Among the sample, 49.5% are Chinese, 28% are Indians and 22.4% are Malays. Most respondents are married (68.2%) while 29% are single. Only 2.8% of the respondents are divorced. 49.5% of the respondents had obtained higher education and 52.3% of them are working as a private employee. As anticipated, most of the respondents (48.6%) are in the bottom 40 (B40) group and 45.8% of them have fair oral hygiene status.

Table 2 shows 40 of the respondents or 37.4% had a poor oral hygiene index, whereas 49 respondents or 45.8% had a fair level of oral hygiene. While 18 respondents or 16.8% were found to have good oral hygiene index.

Table 3 shows a strong and positive correlation between SES and oral hygiene levels (OHIS). As shown in the table $r = 0.659$ and $\rho = 0.00$, ($\alpha = 0.01$). Since $\rho < 0.01$, the relationship is strong, positive and significant.

| Respondent's Profile | | Frequency | Percentage |
|-------------------------|---------------------------|-----------|------------|
| Gender | Male | 48 | 44.9 |
| | Female | 59 | 55.1 |
| Race | Malay | 24 | 22.4 |
| | Chinese | 53 | 49.5 |
| | Indian | 30 | 28.0 |
| Marital Status | Single | 31 | 29.0 |
| | Married | 73 | 68.2 |
| | Divorced | 3 | 2.8 |
| | Widowed | 0 | 0.0 |
| Age (years) | 21-66 | 107 | 100.0 |
| Highest Education Level | Pre-primary education | 0 | 0.0 |
| | Primary education | 2 | 1.9 |
| | Lower secondary education | 6 | 5.6 |
| | Upper secondary education | 31 | 29.0 |
| | Pre-university | 15 | 14.0 |
| | Higher education | 53 | 49.5 |
| | Others | 0 | 0.0 |
| Occupation | Employer | 17 | 15.9 |
| | Government employee | 16 | 15.0 |
| | Private employee | 56 | 52.3 |
| | Self-employed | 10 | 9.3 |
| | Unpaid family worker | 8 | 7.5 |
| Household Income | B 40 | 52 | 48.6 |
| | M 40 | 40 | 37.4 |
| | T 20 | 15 | 14.0 |
| OHI-S | Good | 18 | 16.8 |
| | Fair | 49 | 45.8 |
| | Poor | 40 | 37.4 |

Table 1: Profile of respondents.

| OHI-S | Frequency | Percentage (%) |
|-------|-----------|----------------|
| Good | 18 | 16.8 |
| Fair | 49 | 45.8 |
| Poor | 40 | 37.4 |

Table 2: Oral hygiene index (OHIS) of the respondents.

| | | Oral Hygiene Status of Patients |
|-----|----------------------|---------------------------------|
| SES | Spearman Correlation | 0.659** |
| | Sig. (1-tailed) | 0.00 |
| | N | 107 |

Table 3: Relationship between SES and oral hygiene of patients ($\alpha = 0.01$).

**Correlation is significant at the 0.01 level (1-tailed)

Note:

$r = 0.8-1.00$ (Perfect correlation).

$0.7-0.99$ (Very strong correlation).

$0.5-0.69$ (Strong correlation).

$0.3-0.49$ (Moderately correlation).

$0.1-0.29$ (Weak correlation).

$0.01-0.09$ (Very weak correlation).

Table 4 shows in all cases, $\rho > 0.05$, $\alpha = 0.05$. Thus, as far as this sample is concerned, there are no significant differences between the oral hygiene levels of the 3 major communities of Malaysia, namely, Malays, Chinese and Indians.

| Sig. ($\rho > 0.05$, $\alpha = 0.05$) | Malay | Chinese | Indian |
|--|-------|---------|--------|
| Malay | | 0.602 | 0.747 |
| Chinese | 0.602 | | 0.981 |
| Indian | 0.747 | 0.981 | |

Table 4: Relationship between oral hygiene levels and the three main communities in Malaysia.

The t-Test in table 5 shows that there is no significant difference between the OHIS levels of the two genders. According to the table, the significant two-tailed reading obtained is 0.394. As this is more than 0.05, the researchers can safely conclude that there is no significant difference in the OHIS levels of males and females.

In table 6, household income is the best predictor of oral hygiene levels and its predictive capacity is significant ($\rho = 0.000$, $\alpha = 0.05$). Whereas education has only a predictive capacity of 8.4% on the oral hygiene levels, nonetheless the predictive capacity of education is significant ($\rho = 0.002$, $\alpha = 0.05$). Occupation does not seem to have any predictive capacity towards oral hygiene and its predictive capacity is not significant ($\rho = 0.377$, $\alpha = 0.05$).

| T | df | Sig. (2-tailed) (p) |
|------|-----|---------------------|
| .856 | 105 | .394 |

Table 5: t-Test of OHIS levels between males and females ($\alpha = 0.05$).

| Variable | Predictive Capacity | P Value ($\alpha = 0.05$) |
|------------------|---------------------|-----------------------------|
| Household Income | 45.7% | 0.000 |
| Education | 8.4% | 0.002 |
| Occupation | 0% | 0.377 |

Table 6: Predictive capacities of education, occupation and household income on oral hygiene levels.

Discussion

Oral hygiene status is a measure of the cleanliness of the oral cavity. In this study, the researchers have decided to take the good and fair level of oral hygiene status as having satisfactory oral hygiene whereas the poor oral hygiene status is considered to be unsatisfactory. Overall, the majority of the respondents have a satisfactory oral hygiene level. As oral hygiene status can be linked to the quality of one’s oral health, therefore, good oral hygiene practices are of ultimate importance in the maintenance of oral health [5].

For this study, the SES is denoted by the household income. Evidence has shown one’s oral hygiene is affected by SES. Individuals from the lower socioeconomic group have less awareness and access to oral health care. They are unable to use accessory oral hygiene aids such as mouth rinses, interproximal brushes and various fluoridated toothpastes because of their high cost. Comparatively, individuals from the higher socioeconomic strata have access to all the above mentioned oral health facilities and also the awareness of its role in improving oral health [6]. Clearly, lower SES groups are at a disadvantage in maintaining their oral hygiene. Many efforts should be made to focus on the lower SES group to allow them to improve their oral hygiene for the benefit of their oral health.

This study conducted in Butterworth also denoted that there is no racial discrimination in the provision of dental healthcare. Everyone has an equal access to public oral health care services. Health promotion and health education efforts such as school oral health programs and outreach programs are actively carried out to all. This could be the reason behind the lack of discrepancy of oral hygiene status among the different ethnic groups in Malaysia.

Besides, it also indicates that both genders are equally motivated to maintain their oral hygiene. On the contrary, the result of a study done by Hamasha, *et al.* contradicts with the result of this study [7]. In the study done in Saudi Arabia, it was said that females have a more positive attitude towards oral health compared to males. This has led the researchers to question the correlation between oral health behaviour and oral hygiene status. Thus, the researchers would like future researchers to study this issue.

Consistent with many previous studies, this study reveals that household income is a strong determinant of oral hygiene status. A family of high household income is capable of obtaining better oral hygiene aids and has more options in accessing the oral healthcare facilities. On the other hand, families of lower household income will not pay as much attention towards oral hygiene and they often view oral hygiene maintenance as unimportant. Verlinden, *et al.* have said that children of low SES are at a higher risk of unfavourable preventive oral health behaviour than their high SES counterparts [8]. Therefore, efforts need to be made from the government, schools and paediatric dentists to help to motivate parents of low SES in instilling the importance of oral hygiene maintenance.

Moreover, parents’ education level has a significant impact on the oral hygiene levels of young children. Some studies had concluded that educational level is an important marker of socioeconomic condition and maternal educational level was previously identified as one of the best predictors in all countries for children’s oral health [9]. It was also supported by a study done in Korea which linked lower income to fewer years of education. The prevalence of tooth brushing was higher among the children of parents with higher education, as compared with those with parents of lower education [5].

Lastly, occupation was proved to have no predictive capacity towards oral hygiene status. However, Zaitsu, *et al.* have noted that different workplace parameters are positively associated with the oral health status [10]. This indicates that occupation is an indicator of oral health status. As that study was conducted in Japan, there might be a difference in the working environment compared to Malaysia, leading to contrast in research results. Future researches are needed to address the limitation of this study and further evaluate the relationship between occupation and oral hygiene status.

Conclusion

In conclusion, the oral hygiene level of PIDC patients is satisfactory and is strongly associated with SES. Limited access to health facilities and high cost of accessory dental cleaning aids can be one of the difficulties that is faced by the low SES groups which resulted in poor oral hygiene level.

It can also be concluded that there are no racial and gender inequalities in oral hygiene levels as there were no significant differences were found.

In terms of predictive capacities of education, occupation and household income on oral hygiene levels, household income is the best indicator for oral hygiene level. This may be seen as lower income may be a barrier to the accessibility of dental services and affordability of dental insurance which results in unmet dental needs. Education had slight significance on oral hygiene as well owing to better awareness and knowledge regarding oral health.

In a nutshell, the findings of this study is useful in recognition of target groups for the planning and implementation of dental health programmes and services so as to achieve optimum oral health in all the citizens of Malaysia regardless of their social backgrounds.

Limitations of the Study

1. Small sample size is used within patients visiting PIDC, therefore it does not represent the actual relationship between SES and oral hygiene level in Malaysia.
2. No randomness in sample selection as subjects were selected conveniently from Penang International Dental College.
3. Only Oral Hygiene Index - Simplified (OHI-S) is used, therefore it does not completely measure the oral hygiene status of the respondent.
4. Data regarding the socioeconomic status is obtained by the respondents in a self-reported manner, therefore responses may be subjected to social desirability bias.

Recommendations

1. The sampling should be well planned and done on a randomized basis so that it represents the population ratio in Malaysia.

2. Longer periods of assessment should be implied for proper data representation.
3. Decayed - Missing - Filled Teeth Index (DMFT Index) should be included as an additional assessment of oral hygiene level.
4. Oral hygiene behaviour and practices should be included as a determinant of oral hygiene status.

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