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Oral Cancer Awareness and Knowledge among Marginalised Group in Sungai Petani, Kedah, Malaysia

Sa'adiah Shahabudin^{a*}, Noorsuzana Mohd Shariff^b, Husniyati Roslan^a, Hazwani Ahmad Yusof^b, Rohayu Hami^b

^a*Craniofacial and Biomaterial Science Cluster, Advanced Medical and Dental Institute, Universiti Sains Malaysia, 13200 Kepala Batas, Pulau Pinang, Malaysia*

^b*Healthy Lifestyle Science Cluster, Sains@Bertam, Advanced Medical and Dental Institute, Universiti Sains Malaysia, 13200 Kepala Batas, Pulau Pinang, Malaysia*

*Corresponding author: saadiahsh@usm.my

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ABSTRACT

Oral cancer is the sixth common type of cancer in the world. In Malaysia, it contributes to about 10.6% death in government hospitals. Mortality and morbidity due to oral cancer could be reduced if it could be detected at an early stage. Socioeconomic status is an important determinant of incidence of head and neck cancer. This study investigated the awareness and knowledge of low-income community in Sungai Petani, Kedah, Malaysia and its associated factors. This cross-sectional study used questionnaire with convenient sampling among the community of Paya Nahu who attended our health campaign. Their awareness was fairly good (7, however, their in-depth knowledge on oral cancer was poor with a mean score of 9.68 (SD 4.46). Smoking was the well-known risk factor (64.4%), about half of them knew the sign and symptoms of oral cancer, 77.1% agreed with benefit of early detection and 55% of them knew that mouth self-examination is a step to prevent oral cancer. The unemployed has 0.33 time the odds compared to the employed to have good knowledge (95% CI: 0.120, 0.890, p -value < 0.029) when adjusted for occupation. Media and health campaign were the main sources of information. It is essential to increase awareness and knowledge on oral cancer among the low socioeconomic status community. Since low socioeconomic standard is a factor which restricts health seeking behaviour, outreach programmes such as informative media and improved health campaign should be planned accordingly.

Keywords: *Awareness; knowledge; marginalised group; oral cancer; socioeconomic status*

INTRODUCTION

Being the sixth common type of cancer in the world, oral cancer incidence remains high in developing countries with 275,000 incidence annually (Warnakulasuriya, 2009). Public awareness on oral cancer was

reported to be lower compared to other types of cancer (Prayman *et al.*, 2009). In some study population, they failed to recognise the early signs and symptoms of oral cancer such as red or white patches and unhealed ulcer (Amarasinghe *et al.*, 2010; Devadiga and Prasad, 2010). Lack of knowledge on

early signs and symptoms and the risk factor of oral cancer are the main factors that contribute to delayed presentation (Monteiro *et al.*, 2012). Since early presentation could improve quality of life, reduce morbidity and mortality, the ability to recognise the early sign and symptoms is very crucial for everybody (Ghani *et al.*, 2013).

In Malaysia, oral cancer contributes to about 10.6% deaths in government hospitals (Omar *et al.*, 2006) whereby relatively high percentage (67.1%) of cases were detected at advanced stage (Doss *et al.*, 2011). This fact is attributed by the lack of awareness and knowledge especially the sign and symptoms of oral cancer (Ghani *et al.*, 2013). Being multi-racial in Malaysia, oral cancer incidence varies by ethnic group whereby half of the oral cancer cases in Malaysia were among the Indian population (Ghani *et al.*, 2019). This could be due to the prevalent betel quid chewing habit among the Indians which also suggests that the occurrence of oral cancer is predisposed by lifestyle and cultural practices (Ghani *et al.*, 2019).

Oral screening is an easy and cheap method to detect pre-cancer or early stage oral cancer (Patton *et al.*, 2004). However, detection of oral cancer frequently takes place at late clinical stage (Kumar and Green, 2005). Factors that influence the uptake of oral cancer screening are the awareness of the lesion and knowledge that the lesion could be easily detected by oral screening (Cruz *et al.*, 2002).

Socioeconomic status is an important determinant of incidence of head and neck cancer (Chen *et al.*, 2009). Health is strongly related to poverty (Wagstaff, 2002). Marginalised community is a group of people who are socially excluded and often forgotten due to several reasons such as economic status, access to education, or live in isolated places or depressed areas (Winchester and White, 1988). Low socioeconomic status has more tendency to develop poor health habits such as smoking and betel quid chewing which result in increase in mortality and

morbidity rate among them (Melchior *et al.*, 2007). It is also known that disadvantaged group make less use of the healthcare system for preventive purposes such as oral cancer screening and pap smear test (Turrell and Mathers, 2000). This fact could be due to lack of knowledge among them concerning the importance of early detection of cancer. Knowledge alone is insufficient to change the health behaviour, but it is a prerequisite.

Additionally, a systematic review and meta-analysis on socioeconomic inequalities and oral cancer risk had reported that the lower socioeconomic group has higher risk of oral cancer compared to those of higher socioeconomic group (Conway *et al.*, 2008). In view of these circumstances, we aimed to assess the knowledge and awareness on oral cancer and its associated factors among the low socioeconomic group. In Malaysia, the knowledge and awareness on oral cancer had been previously studied among medical and dental students (Dubai *et al.*, 2012), non-medical background student (Musa *et al.*, 2018) and general population (Ghani *et al.*, 2013) but unfortunately, to the best of our knowledge, no such data is available on low socioeconomic group.

The Paya Nahu community in Sungai Petani, Kedah was appropriate population for this study as it matches the definition of low socioeconomic status based on Malaysia's per capita income whereby their income were less than RM3,000 (Ghani *et al.*, 2019) and additionally because of their uncondusive living environment and low education level. The outcome of this study could be highlighted to the authorities in improving the livelihood level of the community.

MATERIALS AND METHODS

This cross-sectional study was conducted during health campaign in a poor urban community of Paya Nahu in Sungai Petani, Kedah, Malaysia on 20th April 2019. This is a low-cost flat area which accommodates

about 3,400 occupants. By using single proportion formula: $n = (Z/\Delta)^2 p(1-p)$ (Razak *et al.*, 2010) whereby the precision was 0.1, $p = 0.66$ (West *et al.*, 2006), $Z = 1.96$ with 10% non-response rate, the sample size required was 95, but the final subjects recruited were 96, due to the last subject had requested to be included in the study. Convenient sampling was done to recruit subjects above 15 years old who can read and understand Malay or English language and our exclusion criteria were those who had oral cancer as their illness might have some influence on their knowledge on oral cancer. The participants were ushered to the survey counter by the researchers and they were briefed about the study. Informed consent was obtained from those who agreed to participate prior to answering the self-administered questionnaire. The researchers were available at all time to help the participants if they had any difficulty in answering the questionnaire. The answered questionnaires were collected immediately upon completion on the same day. A token of appreciation was given to the participants after the survey. This study was approved by Human Research Ethics Committee, Universiti Sains Malaysia (USM/JEPeM/18040222).

Research Tool

The questionnaire was adopted from previous study (Musa *et al.*, 2018) which had good internal reliability (Cronbach alpha 0.80–0.88). This questionnaire was a simplified version used by Ghani *et al.* (2013) in their study among the general population. It consisted of 3 sections A, B and C. Section A (A1–A10) assessed sociodemographic information; age, gender, ethnicity, education level, occupation, marital status, income, and smoking status. Section B assessed the respondent's awareness and knowledge which consisted of seven questions (B1–B7). Respondent was considered aware of oral cancer if they answered "Yes" for Question B2; "Have you heard regarding mouth cancer before?" For Question B3, there were seven answer

choices for habits related to oral cancer: excess sugar intake, smoking, betel quid chewing, excess alcohol intake, eating spicy food, infrequent brushing teeth and excessive expose to sun. One mark was given to question B3 with scoring range from 0–7 marks. Items in B4, there were three answer choices with regards to early signs of oral cancer: white/red spot inside the mouth, unhealed mouth ulcer within two weeks and gum bleeding. On the other hand, item in B5 and B6, questions related to whether oral cancer can be treated more effectively at an early stage and is mouth self-examination one of the preventive steps for mouth cancer, respectively. Two marks were granted for every correct answer for items B4, B5 and B6, score ranging from 0–10 marks. For item B7, assessed participant's opinion on where they could obtain information on prevention/treatment for oral cancer; government clinic/hospital, private clinic/hospital/traditional medicine centre, non-government organizations such as National Cancer Council Malaysia (MAKNA) and family members/friend, with score ranging from 0–5 marks. In this study, the total score for knowledge ranged from 0–22, respondents scoring 11 and below were considered as having poor knowledge and those scored above 12 as having good knowledge. Section C analysed the source of information on oral cancer.

Statistical Analysis

Data were entered and analysed using SPSS version 24. Categorical data was presented in percentage and frequency while numerical data was presented as mean and standard deviation to describe characteristic of the participants. Simple logistic and multiple logistic were used to analyse sociodemographic factors associated with knowledge at univariable and multivariable level, respectively. Independent factors that were included in the testing were age, gender, ethnic, education, income, marital status, occupation and smoking status. Variables with p -value less than 0.25 were subjected to multivariate analysis. By using forward and

backward likelihood ratio test, the variables were further selected to be included in the model. This was followed by verification of the fit of the preliminary model and the importance of each of the variable. All interaction terms were checked, Hosmer-Lemeshow goodness-of-fit test was carried out and area under the Receiver Operating Characteristic (Walsh *et al.*, 2013) curve was obtained.

RESULTS

Sociodemographic characteristic of the respondents is shown in Table 1. Most of the respondents were females (88.5%) and Malays (91.7%). The mean age was 46.72 (SD 13.96) with minimum and maximum age of 15 and 78 years old, respectively. Majority of them only had secondary education (95.8%), unemployed (68.0%) and earned low income less than RM1,000 per month (79.0%). Since none of the respondents earned more than RM3,000, we decided to regroup the income into only two groups; those who earned below RM1,000 and those above RM1,000 to facilitate analysis.

Table 2 has shown that 77% of the respondents were aware of oral cancer, however, they had poor knowledge on the details of oral cancer. Most of the respondents had poor knowledge on oral cancer with a mean score of 9.68 (SD 4.46) with minimum and maximum knowledge score of 1 and 18 respectively. Smoking was the most known risk factor for oral cancer with 64.6% answered correctly. Other risk factors such as alcohol, betel quid chewing and excessive exposure to sunlight were correctly answered with 38.5%, 35.4% and 19.8% of the respondents, respectively. Only half of the respondents knew about the early signs of oral cancer. Even though 77.1% of the respondents agreed to the benefit of early detection, but only 55.2% knew about mouth self-examination as a mean of oral cancer prevention.

Table 1 Sociodemographic characteristics of the subjects (N = 96)

Variables	Frequency	Percentage (%)
Age		
< 47 years old	44	45.8
≥ 47 years old	52	54.2
Gender		
Male	11	11.5
Female	85	88.5
Ethnic		
Malay	88	91.7
Non-Malay	8	8.3
Marital		
Married	66	68.8
Unmarried/widow	30	31.3
Education		
Tertiary	4	4.2
Secondary	92	95.8
Occupation		
Employed	28	29.2
Unemployed	68	70.8
Income		
> RM1,000	17	17.7
≤ RM1,000	79	82.3
Smoking status		
Smoker	8	8.3
Non-smoker	88	91.7

Media, medical doctor/dentist, and health campaign were the main sources of information on oral cancer with 54.2%, 51.0% and 50.0% respectively as shown in Table 3. Almost half of the respondents could not remember the last time they heard about oral cancer and advice by the medical doctor/dentist had the greatest impact on them.

Simple logistic regression (Table 4) shows that only age, ethnicity, income, and occupations has association with knowledge, however, further forward LR and backward LR showed only ethnicity and occupation as significant. Multiple logistic regression in Table 5 shows only occupation to be significantly associated with knowledge

Table 2 Awareness and knowledge on early signs and risk factors of oral cancer

	Yes N(%)	No N (%)
Awareness		
Have you heard regarding mouth cancer before?	74(77.1)	22(22.9)
Knowledge		
	mean knowledge 9.68 (SD 4.46) (Min-max 1–18)	
Risk factors of oral cancer		
Smoking	62(64.6)	34(35.4)
Alcohol	37(38.5)	59(61.5)
Spicy food	26(27.1)	70(72.9)
Betel quid chewing	34(35.4)	62(64.6)
Excessive UV exposure	19(19.8)	77(80.2)
Excessive in sugar intake	15(15.6)	81(84.4)
Early sign of oral cancer		
Unhealed mouth ulcer	49(51.0)	47(49.0)
White, red spot inside the oral cavity	52(54.2)	44(45.8)
Bleeding gum	51(53.1)	45(46.9)
Benefit of early detection	74(77.1)	22(22.9)
Mouth self-examination as prevention	54(55.2)	42(44.8)

Table 3 Source of information on oral cancer

Source of information	N	%
Source of information on mouth cancer		
Internet	26	27.1
Medical dentist	46	51.0
Media	52	54.2
Health campaign	50	50.0
Family	17	17.7
Last time you heard about cancer		
1–3 Weeks	18	18.8
A year ago	18	18.8
More than a month ago	10	10.4
Cannot remember	46	47.9
More than 3 months ago	4	4.2
Form of message given on mouth cancer		
Documentary	11	11.5
Magazine, book, article	28	29.2
TV, radio, advertisement	56	58.3
Exhibition	41	42.7
Talk show	16	16.7
Information from medical or dentist	11	11.5
Biggest impact on you		
Internet	19	19.8
Medical	42	43.8
Mass media	32	33.3
Health campaign	30	31.3
Family member	19	19.8

($p = 0.0298$). The unemployed respondents had 0.33 time the odds compared to the employed to have good knowledge (95% CI: 0.120, 0.890, p -value < 0.029) when adjusted for occupation. Results of the

Hosmer-Lemeshow model fitness test were not significant ($p = 0.934$) and the area under the ROC curve was 0.641 which is less than 0.7. This model can accurately discriminate 64% of the outcome.

Table 4 Factors associated with knowledge using simple logistic regression

Variables	Knowledge score > 11 n (%)	Knowledge score ≤ 11 n (%)	b ^a	Crude OR ^b (95% CI)	p-value*
Age					
< 47	15 (36.6)	29 (52.7)			
≥ 47	26 (63.4)	26 (47.3)	-0.659	0.517 (0.226, 1.183)	0.118*
Gender					
Female	38 (44.7)	47 (55.3)			
Male	3 (27.3)	8 (72.7)	-0.768	0.464 (0.115, 1.870)	0.280
Ethnic					
Malay	35 (85.4)	53 (96.4)			
Non-Malay	6 (14.6)	2 (3.6)	-1.514	0.220 (0.042, 1.153)	0.073*
Education					
Tertiary	1 (2.4)	3 (5.5)			
Secondary	40 (97.6)	52 (94.5)	-0.836	0.43 (0.043, 4.324)	0.476
Household monthly Income					
> RM 1000	5 (12.2)	12 (21.8)			
≤ RM 1000	36 (87.8)	43 (78.2)	-0.698	0.498 (0.160, 1.546)	0.228*
Marital status					
Married	26 (63.4)	40 (72.7)			
Non-married/widow	15 (36.6)	15 (27.3)	-0.431	0.650 (0.272, 1.551)	0.332
Occupation					
Employed	7 (17.1)	21 (38.2)			
Unemployed	34 (82.9)	34 (61.8)	-1.099	0.333 (0.125, 0.887)	0.028*
Smoking status					
Non-smoker	39 (44.3)	49 (55.7)			
Smoker	2 (25.0)	6 (75.0)	0.870	2.388 (0.456, 12.491)	0.303

*SLR – $p < 0.25$ sig

^aRegression Coefficient, ^b Crude Odds Ratio

Table 5 Factors associated with knowledge test by multiple logistic regression

Variables	b ^a	Adjusted OR ^b (95% CI) ^c	Wald statistic	p-value ^d
Ethnic				
Malay		0.212		
Non-Malay	-1.552	(1.038, 1.166)	3.181	0.074
Occupation				
Employed		0.327		
Unemployed	-1.119	(0.120, 0.890)	4.787	0.0298*

Constant = 1.238; ^ab regression coefficient; ^badjusted odd ratio; ^c95% confidence Interval; ^dp-value MLR < 0.05 significant; Interaction checked and not found; Hosmer-Lemeshow test ($p = 0.934$); Classification table (61.5%); Area under ROC curve = 64.1%

DISCUSSION

This low-cost flat area of Paya Nahu is situated right in the centre of Sungai Petani town in the state of Kedah, Malaysia. The population of Paya Nahu comprised of low socio-economic status (SES) as majority of them earned less than RM1,000 and none of them earned more than RM3,000. Based on Malaysia's per capita income, low SES is defined as earning less than RM3,000 (\approx USD740)/month (Ghani *et al.*, 2019).

This study was conducted during a health campaign. Out of the 3,400 occupants, only about 400 (11.8%) of them attended the campaign. We managed to recruit 24% of those who attended the campaign to participate in the study and most of them were Malays, females, and elderly group. We believe this is the usual scenario in many activities conducted in this community. It is a challenge to achieve full participation of the occupants.

This study showed that even though their awareness was fairly high (77%), but it was not as good as the previous study done on general population (85%) which captured population of various socio-economic backgrounds (Ghani *et al.*, 2013). The in-depth knowledge on oral cancer of the subjects in this study were lower than the previous study (Musa *et al.*, 2018) using the same questionnaire with mean knowledge score of 9.68 (SD 4.46) and 11.4 (SD 3.49) respectively. However, these findings could be influenced by the different background of the subjects whereby the later consisted of students between 20–24 years old wherein majority were males and unmarried. Nevertheless, smoking was the well-known risk factor of oral cancer which is similar to other previous studies (Prayman *et al.*, 2009, Ghani *et al.*, 2013).

It was observed that in this study, 8 out of 11 males were smokers and this may imply that the number of smokers was quite high among the males in this community. This scenario is a norm in low socio-economic community

as smoking is a way of coping with their stressful and hard life (Krueger and Chang, 2008). Furthermore, being low educated, they tend to underestimate the health related hazards of smoking (Peretti-Watel *et al.*, 2007).

Since majority of the respondents were Malays who are typically Muslims, drinking alcohol is prohibited, thus, little is known about alcohol being one of the risk factor which is similar to the finding in previous study on non-medical background students (Musa *et al.*, 2018). Betel quid chewing was popular in the rural area and among elderly people. Nowadays, we can hardly find this activity, especially in town. This could be the reason the respondents were oblivious to this activity and similar result could be seen in previous studies in Malaysia (Ghani *et al.*, 2013, Musa *et al.*, 2018). Little is known about excessive exposure to sunlight that could cause oral cancer which is reflected in our result as only 19% of the respondents answered correctly which is concordant with previous studies (Al-Maweri *et al.*, 2015, Musa *et al.*, 2018). This could be attributed by rare cases of lip cancer in Malaysia compared to white population countries (Warnakulasuriya, 2009) where outdoor activities are popular (Musa *et al.*, 2018).

About half of the respondents recognise the early signs and symptoms of oral cancer and 77.1% agreed with the benefit of early detection, only 55% knew that mouth self-examination (MSE) as mean of oral cancer prevention. Even though they knew about MSE, it is questionable whether they knew how to do the examination. Unfortunately, this study did not include collection of such data. Knowing the signs and symptoms and benefit of early detection of oral cancer but not realising its existence in their mouth is very detrimental. We believe MSE is a very useful tool to detect oral cancer especially among the low-income society as it does not require any specialised instrumentation and does not incur any cost. However, many of high-risk group think that regular dental check-up with the dentist is adequate to

respond to oral cancer prevention. That is the reason why opportunistic screening by dentist still remain the vital means of oral cancer detection (Sankaranarayanan *et al.*, 2013). Unfortunately, the high-risk patients are usually from the low socio-economic income, a factor which also restricts regular attendance to the dentist. This fact is supported by previous study done in United States (Johnson *et al.*, 2012). This matter may be addressed by dissemination of pamphlets on MSE or visual media to the public (Walsh *et al.*, 2013). Additionally, this could be achieved as this study showed that most of the information on oral cancer were through media and health campaign which is in concordance with the previous studies (Ghani *et al.*, 2013; Al-Maweri *et al.*, 2015; Musa *et al.*, 2018). Their lack of knowledge on oral cancer also implies that the existing health campaigns are insufficient to educate them and need to be improved. Furthermore, we believe many health campaigns do not target the low socio-economic and marginalised group which need to be addressed.

Internet has little contribution as source of information on oral cancer in this community. This could be attributed by the cost of the internet service, and not being accustomed to internet usage due to their age (54.2% of the respondents were 47 years old and above) and majority being low educated (95.8% had secondary education level).

Dentist is the most appropriate person to give advice on oral cancer as they have direct visibility to oral cavity (Saleh *et al.*, 2014). This study showed that even though only 11.0% of the information came from the medical doctor and dentist, but it had the highest impact to the respondents compared to other source of information. This could be due to the advice given which were more personalised to the patient. Therefore, dentists should be more aggressive in disseminating information on oral cancer to the public and at the same time implementing opportunistic screening. Despite 84.4% of the respondents dentists

who attended dental conference admitted that they implemented opportunistic screening (Saleh *et al.*, 2014), knowledge on oral cancer are still low among public. This suggests that dissemination of information on oral cancer should be done concurrently with opportunistic screening.

The unemployed respondents had better knowledge on oral cancer compared to employed respondents. This is not a surprising finding as the main source of information was media, the unemployed respondents could have received the information on oral cancer from television, radio and advertisement (Ghani *et al.*, 2013). Moreover, they have more time to spend socialising and could have received the information from friends.

The limitation of this study was very few male subjects had participated in the study which may not be representative of the community of Paya Nahu. This fact could also contribute bias to the number of unemployed participants (68%) which consisted of pensioners, housewives and students. Majority of the participants were Malays (91.7%) which could also contribute to bias, especially regarding knowledge on betel quid chewing habits which is more popular among the Indians. Additionally, the previous study (Ghani *et al.*, 2013) had shown that the Indians were more aware of the detrimental effect of betel quid chewing compared to other ethnicity. Since the model could accurately discriminate only 64% of the outcome, there are some other factors which are not being studied.

Socio-economic status is a determinant of health and being low socio-economic, they are at higher risk to acquire diseases including cancer (Chen *et al.*, 2009). At the same time, low socio-economic status is a factor which restricts health seeking behaviour. Effective outreach programme, improved health campaign and informative media on oral cancer should be emphasised. Assessment on MSE should be carried out among the marginalised group and should

educate them with this cheap and useful method to detect oral cancer.

CONCLUSION

Although the respondents' awareness on oral cancer were fairly good but the knowledge on the sign and symptoms and risk factors of oral cancer was poor. Associated factors that influence knowledge among the marginalised group are ethnicity and occupation. Media, dentists, medical doctors and health campaigns were the main source of information on oral cancer.

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